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BETTER FRUIT

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VOLUME X

FEBRUARY, 1916

NUMBER 8



The Winesap apple has always been recognized as the best very late winter apple for eating of all the red varieties. Its excellence of flavor, its juiciness and beautiful color are all factors which have contributed to its immense popularity. It is one of the most prominent of commercial varieties grown in the Northwest, being produced extensively in Yakima, Wenatchee and Southern Idaho. The acreage in the Northwest set to Winesaps exceeds that of any other variety.

"Health's best way
Eat apples every day"

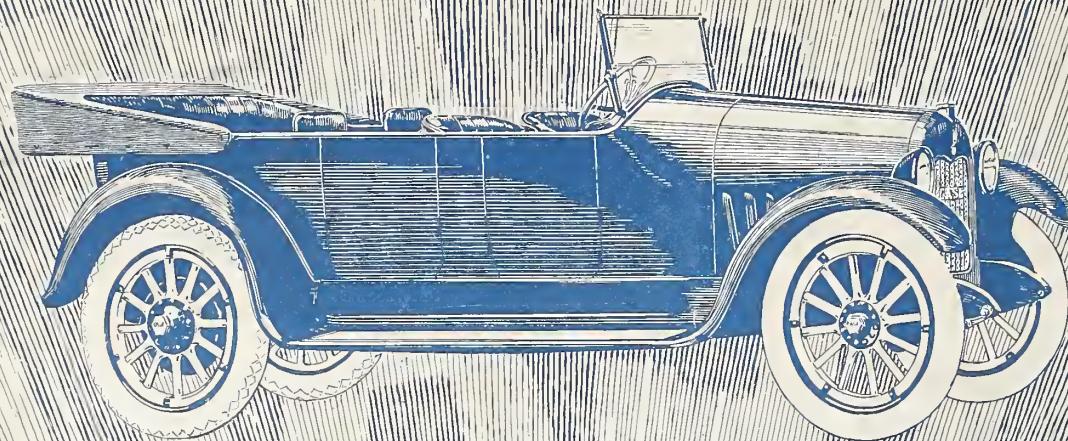
Buy them by the box

"An apple a day
Keeps the doctor away"

BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, HOOD RIVER, OREGON

Subscription \$1.00 per Year in the United States; Canada and Foreign, Including Postage, \$1.50.

Single Copy 10 Cents



Specifications:

WHEEL BASE: 120 inch.

MOTOR: Four cylinder, bore 3½ inch, stroke 6 inch, cylinders cast en bloc integral with crank case, L Head, 40-45 B. H. P.

Westinghouse ignition, starting, lighting.

Lubrication—Force feed to crank shaft and cam shaft bearings; splash to piston pins and cylinder walls.

Carburetor of special design, with feed by gravity from cowl tank, dash adjustment.

Radiator—Cellular type, with thermo-syphon circulating system.

CLUTCH: Cone.

TRANSMISSION: Selective, three speeds forward and one reverse; three point suspension, in unit with power plant, left hand drive, center control, Timken bearings, Spicer universal joint.

AXLES: Rear—Weston-Mott; $\frac{3}{4}$ -floating, with spiral bevel gears; torque and drive thrust taken by torque tube to rear end of transmission through a ball and socket joint; pinion shaft provided with two Bock, roller type, bearings. Front—I-beam, designed and built by Case; Timken bearings; I-beam section, steering arms, steering knuckles and king pins all of special chrome nickel steel—forged, heat treated and machined in our shops.

FRAME: Designed with exceptionally deep section, greatest depth at center where front hanger of cantilever spring is suspended.

SPRINGS: Rear—Cantilever, 50 inches long, $2\frac{1}{2}$ inches wide; attached to rear axle by means of universal joints, which take all side play, allowing springs to do full spring duty—an exclusive feature in construction.

WHEELS: 34x4 inch, Artillery type, with Goodyear detachable, demountable rims.

BODY: All steel, with removable upholstery of genuine grain leather. Front seats divided, and are adjustable forward and backward, as are the clutch and brake-pedals. Firish—Brewster green, with ivory stripe.

EQUIPMENT: One-man top, with dust hood and quickly adjustable side curtains. Stewart-Warner Speedometer. Windshield—Rain vision, ventilating. Tires—Goodyear 34x4 inch, non-skid on rear. Motor-driven horn. Regular tools, tire repair kit, etc., etc.

CASE: \$1090, f. o. b. Racine.

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While quite different—while lower in price—the new Case 40 is designed for the substantial sort of man who is not swayed by passing innovations—the man who is cautious and wants a tried, riskless car. For 74 years Case executives and workmen have been building according to Case standard—never leaving that straightaway path called Quality which has brought such world-wide reputation. The Case Cars are built entirely by Case trained workmen in the Case plants.

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Everywhere are men who know the former Case 40—men who found it well worth \$2300. These men particularly will welcome this announcement—for now they can recommend the new Case 40, with its obvious improvements, to their friends. Owners will tell of its serviceability of its modest upkeep and how it resists depreciation. The splendid service of the former Case 40 can be expected of our new 40.

The refinements of this car are individual. Its combination of excellencies is bound to be appreciated and wanted by the motor-wise and discriminating. We predict a well-deserved sensation for this car.

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It's so easy to smoke; so easy to get acquainted with and call by its first name; so gentle and friendly to your tongue and throat! P. A. will absolutely delight you in a jimmypipe or rolled into a cigarette; it will revolutionize any tobacco notions you ever had! The patented process fixes that—and *cuts out* bite and parch!

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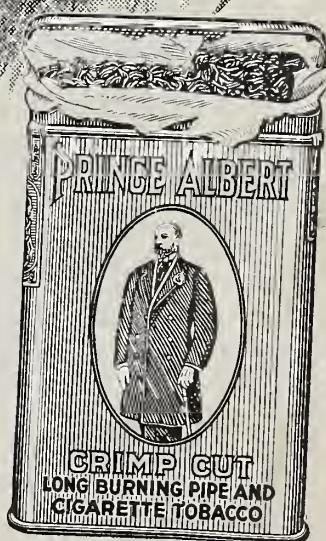
satisfies every desire in your cigarette makin's or jimmypipe department.

Roll some makin's cigarettes. It's easy, because Prince Albert is crimp cut, *and stays put!* Or jam a jimmypipe brimful and get the delights of P. A. via the briar, corncob or meerschaum! It's all one and the same when it comes down to the amount of tip-top-joy *per puff!*

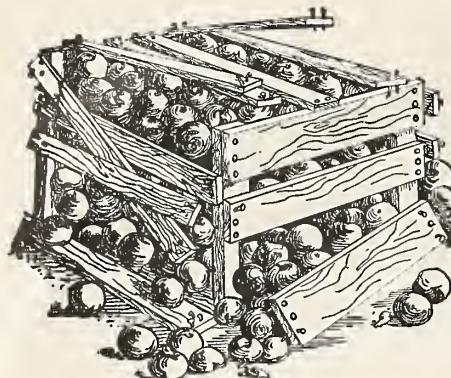
R. J. REYNOLDS TOBACCO CO., Winston-Salem, N. C.

*Buy Prince Albert everywhere
tobacco is sold in toppy red
bags, 5c; tidy red tins, 10c;
handsome pound and half-
pound tin humidors—and
that corking fine crystal-glass
humidor with sponge-moist-
ener top that keeps the to-
bacco in such clever trim—
always!*

Copyright
1916 by
R. J. Reynolds
Tobacco Co.



On the reverse side of this tidy red tin you will read: "Process Patented July 30th, 1907," which has made three men smoke pipes where one smoked before!

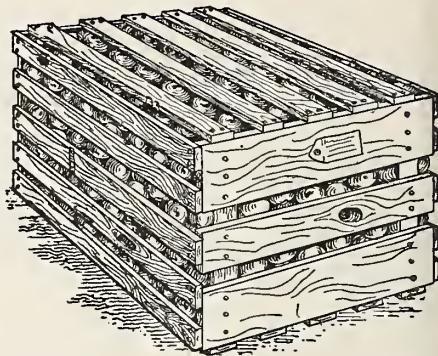


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Western Cement Coated Nails for Western Growers

Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

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4% Interest Paid on Savings
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PEARSON

ECONOMY in buying is getting the best value for the money, not always in getting the lowest prices. PEARSON prices are right.

ADHESIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.

RELIABILITY behind the goods is added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.

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ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime you play safe.

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WE GIVE SPECIAL ATTENTION TO GOOD FARM LOANS

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Spraying Lemons Near Santa Paula, California.



Spraying Grapes in New York State.



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"Used Round the World"

In the orange-growing sections of the Transvaal, South Africa—in the lemon groves of Southern California—in the vineyards and fruit-growing sections of old New York State—in the grapefruit groves of Florida—in the orchards of Australia—wherever fruit is grown and spraying is required there you will find the Bean at work. Bean outfits are

Noted for Downright Dependability

There are 30 years of experience back of the Bean line—30 years of steady improvement and constant betterment. They have many distinctive, important advantages—many of them found on no other outfits. We call your attention especially to the following:

BEAN PATENTED AUTOMATIC PRESSURE REGULATOR—which ends all safety-valve troubles. Absolutely safe and certain. When nozzles are shut off, the liquid is simply pumped back into the tank, without being put under pressure. Saves fuel and much wear and tear on engine and pump.

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BEAN REFILLER—Fills 200-gallon tank in five minutes.

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NOVO ENGINE—The simplest, sturdiest, most efficient little engine on the market, and unsurpassed for sprayer use.

Bean Sprayers Made in All Sizes

We make a complete line of Power Sprayers at from \$100.00 up—as well as Hand and Barrel Pumps, Nozzles, Hose and all Pump Accessories.

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Gentlemen: Please send me your 1916 Catalog of Hand and Power Sprayers. I have.....acres of.....trees, and am interested in Hand Pumps..... Power Sprayers..... Accessories.....

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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

The Influence of Supply on Prices

A. U. Chaney, General Manager American Cranberry Exchange, New York, before Twelfth Annual Meeting of Western Fruit Jobbers' Association.

MY experience has been confined largely to the marketing and distribution of fresh fruits, and to these I shall apply my subject. The price of foods that are considered prime necessities, such as grain, potatoes, meat, eggs, butter, etc., I believe to be less easily influenced by the supply, and much less by the weather, than of fresh fruits that are considered luxuries, such as strawberries, peaches, pineapples, cranberries, apples, grapefruit, oranges, etc. We must concede that the market price of any article is determined by the law of supply and demand. The demand, I believe, affects the price on fresh fruits more quickly than the supply. Then let us first discuss what influences the demand.

The demand for fresh fruits is influenced by weather conditions, quality and appearance, packing, container, advertising, stability of market and the price. The weather is often a greater factor than the price in creating or retarding the demand to an abnormal degree. For example, lemons, cantaloupes, strawberries, etc., are in greater demand when the weather is hot; whereas apples, cranberries, sweet potatoes, cabbage, etc., enjoy the greatest demand in cool weather. Ask almost any market expert to hazard an opinion as to the probable market price of fresh fruits even as much as one week ahead, and he usually prefaces his answer by providing for weather conditions. The United States Weather Bureau is of invaluable assistance to marketing men by the issuing of dependable weather predictions a few days in advance. I am sure it is the wish of all fruitmen that the time is not far distant when the Weather Bureau will be able to give us reliable predictions two weeks in advance. In determining the proper price for future deliveries normal weather conditions only should be considered.

The quality and appearance of fresh fruit more easily influences the desire of the consumer than the price. The desire seems to be more easily created by sight than by taste. Quality and packing of fresh fruit is of such importance that proper standards of quality or grading of all varieties of fruit and produce should be established, either by the government or by growers' or trade organizations. Producers everywhere should be educated to the supreme importance of quality and appearance. Fruit should be picked in prime condition, and it should be stored and packed so that it will reach the consumer while it is attractive and sound.

Good packing influences the demand decidedly. The highest quality of fruit often has a large per cent of its value wasted by careless, improper packing, even though packed in proper packages. Much of the trouble is caused by lack of knowledge of how to pack properly. Especially is this true among the small growers. Much of it is caused by growers' inability to secure experienced, trained packers. This is especially true in new producing districts. Some of the poor packing is caused by the lack of appreciation of the producer as to its importance, and coupled with this is his desire to pack cheaply, and such an offender usually disregards advice until he has tried out all markets and various sales agents in an effort to get full price for cheaper packing. To some degree every shipment of poorly-packed fruit reduces the value of all receipts of similar fruit in the market that it reaches.

The container should be such as will best insure the safe transportation of its contents, be of convenient size, and be neat and clean in appearance, and when opened it should so display its contents as to attract the consumer's attention. The necessity of national standardization of containers is constantly growing in importance. Standards of measure greatly vary in different states and communities. Shipments of the same commodity may reach a market like New York City on the same day from many different states, packed in almost as many different styles or sizes of containers, according to the custom or state law. Under such chaotic conditions proper prices can hardly be determined and unnecessary annoyance and waste of values is the natural result. The last U. S. Congress, influenced by the urgent solicitation of the United States Bureau of Weights and Measures and various growers' and trade associations, enacted a national mandatory barrel law, giving us a standard barrel of all fruits and vegetables. I trust this is the forerunner of a national standard container for all fresh fruits.

The advertising feature affecting demand is of more importance than many producers and dealers appreciate. The seasons for some of our very best fruits are short and often they are half over before a large part of the consuming public knows or realizes what fruits are "in season." A great many retail dealers fail to buy or display a variety of fruit until they begin to have call for it from the consumer. Often this is the sole cause of slack demand and

abnormally low prices during the first part of the season. By advertising at the proper time in ways that will attract the notice of retailers and consumers, the demand is greatly increased.

The stability of market, when possible to secure it, I believe, goes farther toward encouraging the jobber and retailer to push sales and take special interest in a fresh product than anything else. It is my observation that the consumption of fresh fruit, perhaps more than anything else, increases according to the degree the sale is pushed. The rapidly-increasing crops of fruits make it imperative that a demand be created that is far beyond the natural call. There is a vast difference between the sale of fruit which the dealer simply has for sale for those who come to inquire for it than there is for the fruit which the jobbers must dispose of by sending out salesmen to solicit orders from retailers, because, in addition, the salesman should inform the retailer as to what is in the market and what is due to arrive soon, and enthuse the retailer, in turn, to solicit the consumers' consideration.

The jobber and retailer are the natural acting salesmen for the producer, and on these salesmen's efforts the growers' interest depends. They are the necessary connecting links between the producer and consumer. The interest they take in pushing the sale of fresh fruits is naturally influenced by the certainty of their remuneration. The smallest liability to loss and the greatest certainty of a moderate profit interest them more quickly and certainly than the possibility of large profits, coupled with the danger of serious losses. They are somewhat like a certain United States congressman who had been a leading attorney in his home district. A friend asked him how he could afford to give up his law practice for a congressman's salary. He answered: "The salary is almighty regular." Dealers are often severely criticised for charging seemingly exorbitant profits on fresh fruits. The frequency of violently fluctuating values and heavy shrinkages causing such a large per cent of loss, make margins which appear unreasonable necessary. Large corporations or organizations and close co-operation among both growers and jobbers in order to regulate the supply and distribution so that all fresh fruit and produce may reach the consumer while in prime, palatable and attractive condition (giving the consumer true value instead of wasty, decayed and unsatisfactory food)

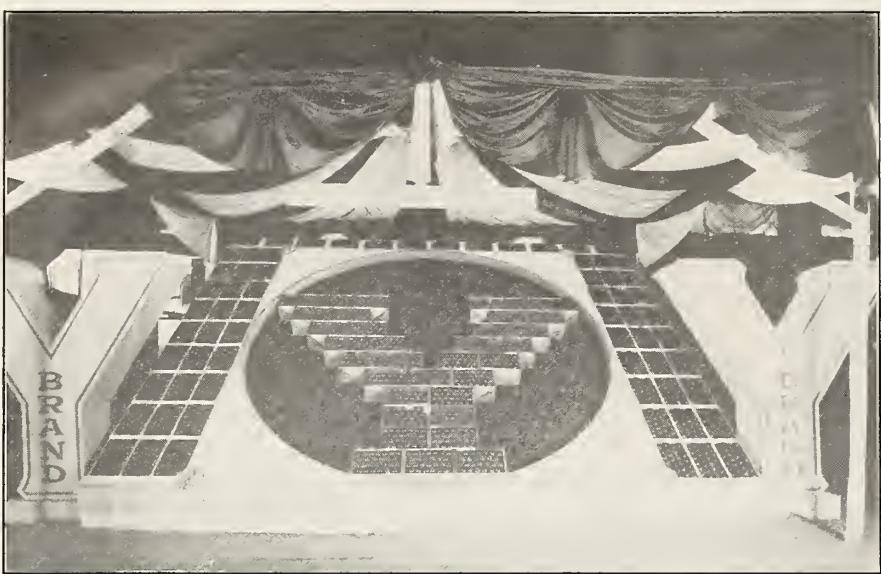


Exhibit winning the first prize, made by the Yakima Valley Fruit Growers' Association at the Eighth National Apple Show, held in Spokane November 15 to 20, in the apple shippers' 100-box contest for the most striking advertising display of the brand of Extra Fancy apples it is offering on the market.



Exhibit of the Spokane Valley Growers' Union in the apple shippers' 100-box contest for the most striking advertising display of the brand of Extra Fancy apples that it is offering on the market. This exhibit won second prize at the Eighth National Apple Show, held in Spokane November 15 to 20, 1915.

would tend to establish this market stability, broaden distribution, increase the interest of dealers, greatly increase consumption and reduce the present necessary margin of profit or cost between producer and consumer more than any other system. One salesman for a large jobbing house distributing a full line of fruit and produce could easily visit thirty city retail dealers in a single day and fully inform each of the thirty concerning all fruits and produce in the market and due to arrive. Moreover, he could take orders from each of the thirty for delivery on the following day. One to three trucks could make deliveries to the whole thirty on a single trip.

Today in our large market centers each of these thirty retailers must go to market and send or take his truck and secure and haul his own supplies for the day. This system takes the valuable time of the thirty retailers from their stores and thirty trucks to do the work that one salesman and from one to three trucks could do better. Mr. Retailer can, if he wishes, and often does, buy his supply from second-hand dealers, from what is known as a wagon peddler who has bought a load of truck on the market and peddles it out to retail dealers for such profit as he can command. Such retailers must be content to have "on sale" the limited assortment which he can secure from the peddler wagon. To

economize time, Mr. Retailer, who goes to the market, often makes two trips a week and plans to buy a sufficient supply to last until the next regular trip, thus causing what is known as the "big days" on a market. Naturally, such a system does not insure a full daily supply of strictly fresh stocks in the retail places.

Much of the fruit is shipped from the producing point to what are known as "receivers" in our large centers, and then sold by the receivers through independent auctions to jobbers, and then by the jobber it is sold to either the retailer who comes to the market and buys and takes away his supplies, or to the wagon peddlers, who, in turn, sell to the retailers, who, in turn, sell to the consumers. How much more simple and economical in time, expense, profits, and how much less deterioration would take place if the fruit or produce could be shipped to large jobbing houses in the first instance and by them sold and delivered direct to retail dealers. Right here is where I believe the present system of marketing in great centers is out of date and economically wrong. I believe the auction system is our greatest disturber of market stability, and does little to encourage trade or consumption. Indeed, more modern methods should be fostered. The fruit-growing industry has increased in a few years to enormous proportions, but marketing and distributing facilities have not kept pace with this growth, so the industry is suffering great waste and loss for lack of proper marketing equipment. Because of the perishable nature of fruit and because the industry has been considered a peddler's job, the large capitalists have not been attracted to it as they have to meat, grain, etc. This, I believe, is what the country is in great need of, and should be encouraged.

The price is perhaps the last, but not the least, item to consider in influencing demand. The desire for our fruits must first exist in the mind of the consumer and then the price must be within his means to insure his purchase, and it must be in proper relation to values of competitive foods. The question of the high or low prices of food is a psychological one, and the haphazard, random statements frequently appearing in the newspapers and magazines that, at best, deal only in generalities and seldom touch the facts as applied to fruits, is one of the factors in destroying demand, because the consumer assumes through repeated reading that a commodity is high when in reality it is low. There is, however, always a high point in values, where, if it is reached, the consuming masses will turn to substitutes and a later reduction in price will seldom bring back the consumers' favor during that season. Marketing men generally understand the serious danger of a high price diverting consumption away from their product.

Example: During the cranberry season of 1912 I addressed the following

query to two hundred retail dealers throughout the United States: "Supposing the retail price of cranberries is $8\frac{1}{3}$ cents per quart, or three quarts for 25 cents, please state what reduction in your sales would result from advancing the price to 10 cents per quart, $12\frac{1}{2}$ cents per quart, 15 cents and 20 cents." I received ninety-two replies and from twenty different markets located in sixteen different states. The average of these replies showed that the estimated percentage of decrease of sales as price advanced was as follows: Advance from $8\frac{1}{3}$ cents to 10 cents per quart, reduced sales 12%; from 10 cents to $12\frac{1}{2}$ cents, 23%; from $12\frac{1}{2}$ cents to 15 cents, 37%; from 15 cents to 20 cents, 67%. This same inquiry was made by the Hon. J. A. Gaynor of Grand Rapids, Wisconsin, a prominent cranberry grower, to one hundred retailers in the State of Wisconsin in 1906, with the following result: Advance from 10 cents to $12\frac{1}{2}$ cents per quart, reduced sales 49%; from $12\frac{1}{2}$ cents to 15 cents, 74%. The difference between Mr. Gaynor's figures of 1906 and my own of 1912 may be because of increased regular cranberry consumers in the later year, or by the difference in the purchasing power of the dollar.

The supply is not appreciably affected by price, except as prices reach abnormally high levels and draw supplies from remote sections, or by abnormally low prices diverting away from a given market supplies intended for it, retarding shipments or preventing shipments altogether by the price being below the cost of packing, transportation and marketing expenses. A decreased supply is less likely to cause an advance than an increased supply will cause a decline. The price may be so adversely affected by the supply of fresh fruit and vegetables being thrown on the market in excess of the demand that, in order to secure and insure any stability of price, the control, or partial control, of the supply seems absolutely necessary, and so necessary that I believe the government should recognize its necessity and extend to agencies marketing for the growers the same latitude extended to the growers themselves in the way of permitting and encouraging their organization for exchange of information and control and regulation of distribution. Most of our fruits and produce cannot be held long in prime condition, even in the best of cold storages. They must be sold while they are sound and attractive and cannot be held for ransom. Thus monopolies on fruits are an impossibility because of the very nature of the goods. Moreover, policies of conservation are necessary if the producer is to reap any reward for his labor and if the consumer is to have a fresh, fine article at a stable, reasonable value without fluctuations which destroy or adversely influence the demand. The control of the supply should be legitimate and only sufficient to maintain the demand relatively to the crop produced. The business of trading in fresh fruits and



Exhibit made by the Wenatchee North Central Distributors at the Eighth National Apple Show, Spokane, in the apple shippers' 100-box contest for the most striking advertising display of the brand of Extra Fancy apples that it is offering on the market.



The Idaho-Oregon Fruit Growers' Association exhibit at the Eighth National Apple Show, Spokane, November 15 to 20, in the apple shippers' 100-box contest for the most striking advertising display of the brand of Extra Fancy apples that it is offering on the market.

vegetables is probably the only one in which supply and demand entirely control values.

There is always a low point reached, in case of an oversupplied market, where no lower price will increase the sale. The consuming masses under any marketing system now in vogue in large centers cannot be made to respond with sufficient demand to relieve a glutted market before the fruit or produce has so deteriorated as to be unattractive to most of the consumers, if not unfit for food. This fact explains the reports of carloads of fruit or produce which are being dumped while price in uptown retail stores is but slightly changed. The commission merchants or receivers must bear the burden of unjust criticism. Price of fresh fruit can be so low, caused by excessive supply, that there is no room for profitable margins to commission merchants,

jobbers or dealers; hence the trade will not use much effort to sell them and will bend all their energy to sell other things in which there is a profit. From this cause often rises the statement that when prices are high more fruits sell than when they are low. Last summer potatoes were very cheap and netted a price to many growers below the cost of production. I heard more than one grower and dealer remark that people did not seem to eat many potatoes when they were so cheap.

Marketing men, I am sure, will agree that a large supply under proper control can be distributed to the markets of the country at much better prices to the producers and at perhaps as low cost to the consumer, and to greater satisfaction and more certain profit to the dealers, than a smaller supply uncontrolled or unguided. A very great deal of waste and heavy losses con-

stantly occur by shipments being sent at random, totally without regard to the demands of such market for that variety or grade. Markets greatly vary in their demands for character, variety and color of fruits, according to the customs of the people and tastes previously acquired, and this knowledge is of vital importance in supplying their requirements.

Supplies are often forced on the markets unduly by the necessity of getting money for the producers to pay picking and other expenses. The difficulty growers have in borrowing money from their home banks has much to do with this. Some kind of government aid in this direction might be of good service.

The Season's Opening Price.—The season for many of our fruits begins with light shipments and the supply for the first few days, which is unequal to the demand for the first arrivals, causes abnormally high prices being paid for the first deliveries, and this

act establishes the price at retail at too high a level. The retail dealer, because of his custom to have a uniform average price, instead of changing his price from day to day as the wholesale market fluctuates, is slow to reduce his opening price, and thus the high price fixed by the first small shipments retards the free consumption that the heavy supply in the midst of the season greatly needs. When a commodity is under at least partial control all efforts should be made by competent authority to determine the right price in proportion to the season's total production and maximum consumption, which will distribute the entire crop over the whole marketing season, and which will insure, so far as is possible, stability in market conditions, making it safe for dealers to operate freely on reasonable margins of profit, and furnish consumers with prime fruit at reasonable prices. The wrong price results in fluctuations in supply and demand which cause the consumer to

pay excessive prices for good fruit in times of scarcity, or frequently to receive stale, unpalatable fruit at prices out of proportion to the ruinously low prices obtaining in wholesale markets in times of glut. The right opening price would yield maximum returns to the producers as a whole, so any price above or below that right price lessens the money received and injures the grower, the legitimate dealer and the consumer. The loss caused by a too low or too high price is in wasted effort and by wasted or deteriorated material. The government and producers' and dealers' associations should more and more foster such a control as will restrain early shipments of fruit until it is of sufficient maturity to be good food and then render all aid possible in determining proper values being established. It is safer and more beneficial to all, in the end, to start the price too low, rather than to endanger an ample demand by placing the price too high at the start.

The influence of supply on prices is dependent upon the natural and artificially-created demand upon the control, or lack of control, of the supply and the facilities for and manner of distribution. The natural demand is mostly influenced by weather conditions and the quality and appearance of the fruit, and the artificial demand is created mainly by the efforts, good will and energy of the middlemen or salesmen, by advertising, and by the price. The facilities and equipment for distribution should be such as will deliver the fruit from the producer to the consumer with the least delay and least handling and rehandling that can be made practical. The present average yearly production of fruits is so near the present maximum consumption under existing marketing methods as to seriously endanger the possibility of marketing the whole output at prices profitable to the producers, and serious consideration should be given to all possible improved and economical methods of marketing. Jobbers having a very large capital are needed to facilitate most economical distribution in our large cities. National standardization of weights and containers should be established. Close co-operative control of supply and regulation of distribution should be permitted and fostered by the government to lessen the risks of dealing in fresh fruits and vegetables and to aid in establishing stability of values.

Pruning the Bearing Apple and Pear Trees

Continued from last issue

The Application of Pruning Principles to Particular Problems

The application of these principles to the particular pruning problems presented by individual trees is a matter requiring good judgment. However, if some of the principles underlying pruning practices are understood serious mistakes are much less apt to be made. From the discussion of these

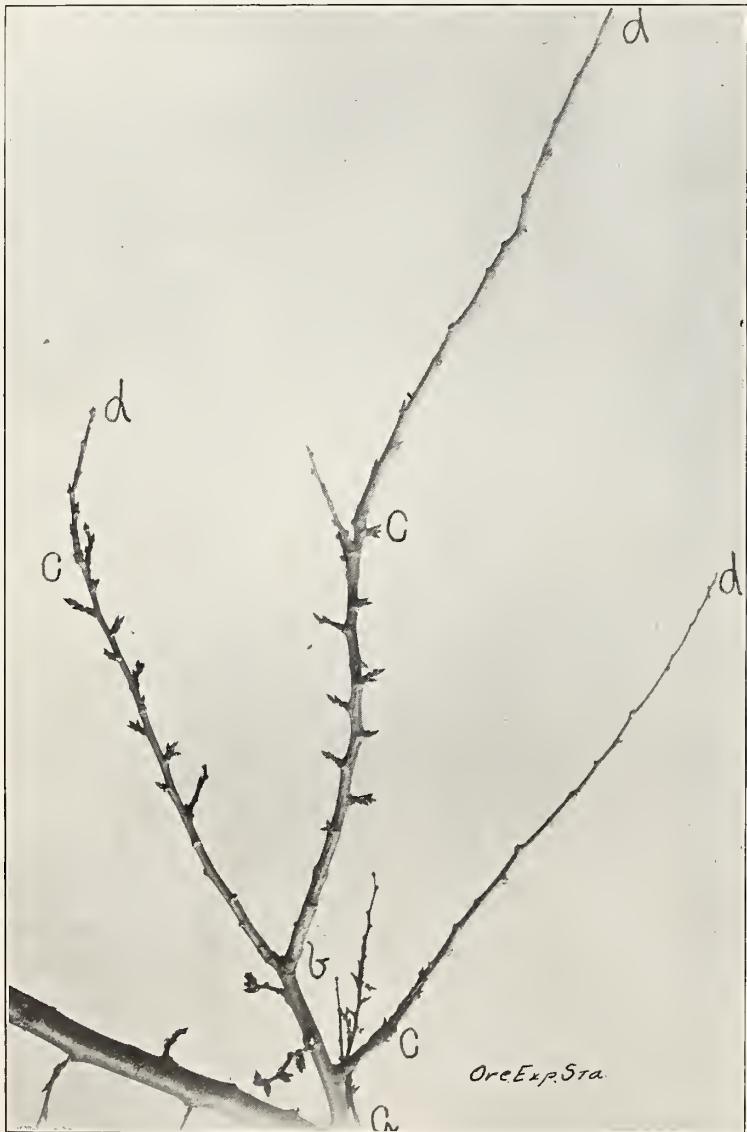


FIGURE 49.—A small limb from the top of an Italian prune tree, showing how spurs develop from the shoots of the preceding season. From *a* to *b* is three-year-old wood. Two years ago three shoots, *b* to *c*, and two fruit spurs were formed. Last year three shoots, *c* to *d*, developed from the terminal buds of the preceding season's growth and a number of fruit spurs from its lateral buds. The lateral buds on these fruit spurs are fruit buds; the terminal buds are leaf buds.

principles, it would seem that one of the first things to observe before pruning a tree is whether or not it already possesses a fairly good balance between vegetative growth and fruit production. If it possesses this balance it should be maintained. This would probably mean a moderate heading back of some of the new shoots, especially the more wayward ones, with the idea of maintaining and developing the shape of the tree and mildly stimulating vegetative growth. It would also mean a moderate thinning out to encourage the development of a reasonable number of fruit-spurs, and to afford conditions favorable to the long life and regular bearing of those already formed. If the tree has been growing too vigorously; if it possesses a large number of strong shoots; if it has been producing many watersprouts; if its fruit-spurs are few in number and irregular in bearing, the practice in pruning should be such as will develop new fruit-producing machinery—fruit-spurs—and invigorate and strengthen that already in its possession. This probably means very little heading back and only a light thinning out the first season. This treatment would stimulate the development of a large number of new spurs and could be followed one or two years later with a somewhat heavier thinning of branches, to strengthen and invigorate the older spurs. Many would object to this method of treating over-vigorous trees, fearing that if they were not to head back the shoots generally it would result in their growing "beyond bounds," or becoming "ranny." It is believed, nevertheless, that it is the most certain method of correcting the over-vigorous condition of many fruit trees. A year or two later, when the tree has become fruitful, its top can be gradually brought "within bounds." The willowy or pole-like character of some of its branches can be corrected by heading some of them back severely, cutting into two or even three-year-old wood. It would probably be a mistake to cut back a large proportion of the branches in any one year thus severely, but if the practice is extended over several years it is reasonable to believe that little injury would follow.

On the other hand, if the tree shows evidence of continued neglect, if it possesses large numbers of old but irregular-bearing fruit-spurs; if it has been making very little shoot growth, pruning should be such as to stimulate vegetative processes. Thinning out in this case will take the form of removing old branches with their fruit-spurs so as to divert a larger amount of food material into those remaining, and also into new shoot growth. It will also be desirable to head back the remaining limbs and shoots more or less severely so as to stimulate still further vegetative activities of the tree. That heading back alone will not prove a corrective for trees of the type just described is well illustrated by Figure 48, showing a tree upon which the experiment was tried. The spurs that have since formed upon the new

growth are strong and vigorous, but apparently the new growth drew so heavily upon the energies of the tree and shaded so completely the old spurs lower down in it that the latter have profited very little by the treatment.

The fact is, it is difficult to conceive of trees of bearing age in which it would be desirable to stimulate fruit production alone and absolutely check vegetative growth, or, conversely, to stimulate vegetative growth alone and

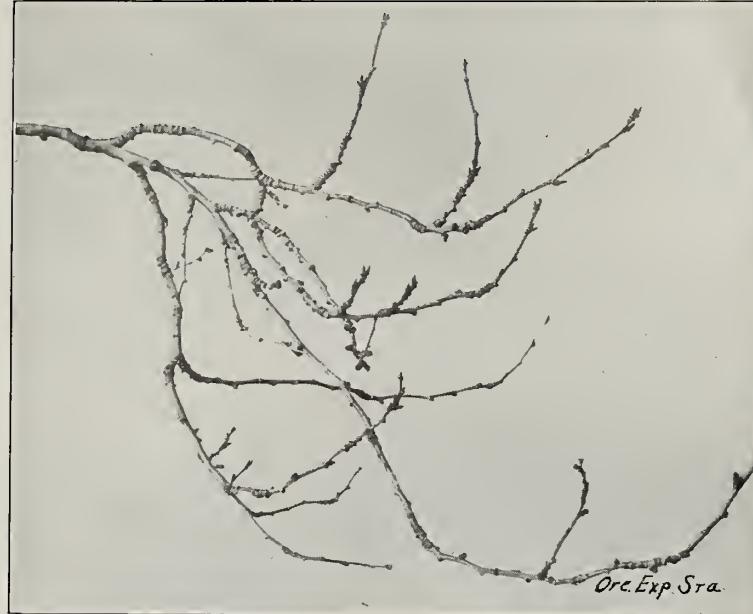


FIGURE 50—An old, much-branched fruit spur in an Italian prune tree. Note that some of its branches are dead; the living ones are slender and lacking in vigor. There are present only a few fruit buds and these are near the ends of the branches. It is probably only a matter of a short time before the whole spur will die. Its present condition is the result of too much shading by the branches above it



FIGURE 51—An old Italian prune tree whose top has been kept thinned out fairly well. Note the presence of small fruiting branches well down on the scaffold limbs as a result. Note also that a large portion of the fruit spurs and small fruiting limbs in this tree are stocky and vigorous

completely stop the work of the fruiting machinery. We desire a proper balance between the two kinds of growth. To maintain it, or even to restore it when it is lacking, usually requires a certain amount of both kinds of pruning, heading back and thinning out. The desirability of the results obtained from mainly heading back or mainly thinning out in restoring the balance in an unfruitful tree of bearing age depends upon how correctly its present over-vigorous or under-vigorous condition is estimated, as well as upon a knowledge of the probable effect of the different pruning practices.

Cheer for Fruitgrowers

"When Fruit Men Get Scared" is the title of an article written by James H. Collins, who spent several weeks here last summer, appearing in *The Country Gentleman* of January 1. But the article bears a message that should be gratifying to all fruit men, of tried districts, and especially cheering to the faithful among the growers of the Hood River Valley.

Mr. Collins visited the most of the apple districts as well as the citrus belts last year. His opening paragraph shows that he observed conditions pretty closely. He says:

"The big crop last year in famous winter-fruit sections seemed to be not apples or oranges but meetings. Long before blossoming time the clans began gathering. From the citrus groves of California to those of Porto Rico the growers came together for debate and organization, as well as for ructions and disorganization, and the apple world was in a ferment from the Rogue River Valley of Oregon to the Shenandoah Valley of Virginia."

In another paragraph he says:

"So the growers everywhere began holding meetings, criticising officers, managers and market methods, withdrawing from old organizations and forming new ones, listening to explanations, plans, dreams. One kind of grower, with a clear head, understood that it was the time to hang on to his interests, even though mortgages and loans made it desperately hard, and with the aid of the banker he hung accordingly. Another type of grower, yielding to gloom and discouragement, talked of letting go, of getting out of fruit into some profitable line, of chopping down his trees and raising grain or hay—on five-hundred-dollar land!"

Then comes the message to growers and shippers and the cheer for the faithful. Extracts from the body of Mr. Collins' article are as follows:

"These are mighty interesting times in the fruit industry. On the surface, with all the clamor and pessimism, it often looks as though everything were going to pieces. But down underneath, the real meaning is reconstruction on a sounder business basis. Old evils in production are being eliminated and broader ideas of marketing are coming in everywhere. The need for organization at home, where fruit is produced,

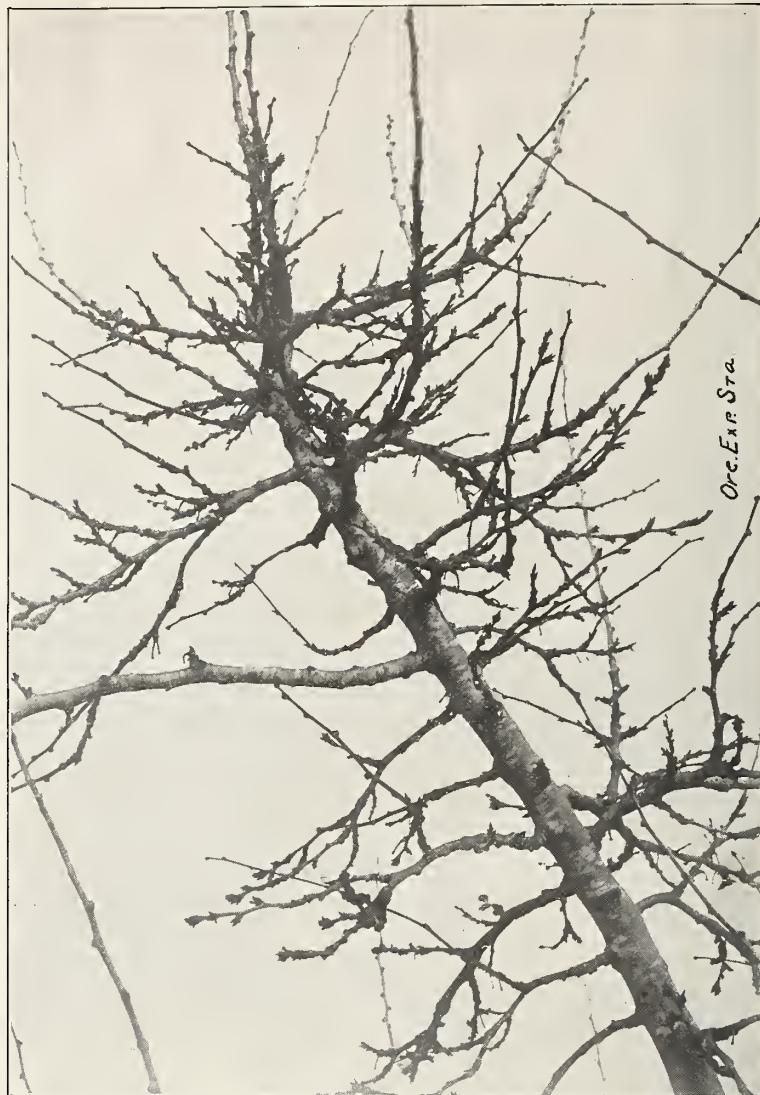


FIGURE 52—A limb in the upper part of an Italian prune tree. The individual spurs have had an abundant supply of light. Note that not only the individual spurs but also the small fruiting limbs are short, stocky and vigorous. However, it would be desirable to remove a few of the smaller branches to prevent too heavy shading of those lower in the tree

is clearly seen by most growers, because shortcomings are close at hand. The need for organization in the big markets is not so clearly seen, because those markets are far off, little understood by growers, and the factors that make for success or failure, good prices or bad, are not in evidence to them.

"Big crops were a factor in the ruinous prices of a year ago; so was war.

"But it is fairly certain that with better understanding of market conditions by growers and better organization of shipments, there would have been much better prices.

"Nine growers in ten believe that low prices are due to glutting of markets. Real market gluts of fruit like winter apples, which can be stored and held for months, are much rarer than is commonly supposed, and while citrus fruit cannot be held so long, once it is off the tree, it still has a margin of stability that makes it entirely different from berries and soft fruits, which must be handled quickly.

"Seventy-five per cent of all the so-called market gluts of winter fruit,

with falling prices, are probably price scares instead. They can be prevented by better organization of growers and produce men, and that will come as soon as the operation of price panics is more widely understood.

"Under normal circumstances, by skillful organization, storage and salesmanship the Northwest would probably have made some profit on box apples. But individual growers, under pressure of freight or debt, began consigning their fruit to Eastern markets in competition with growers' associations, and in a little while whatever confidence existed was destroyed and prices had dropped to less than freight charges.

"One of the big Northwestern growers' organizations sent a representative through the Middle West selling apples. He found many towns where box fruit had never been handled and sold lots of three to ten cars in such places. Fruit dealers paid association prices and began selling the consumers at moderate margins of profit, to assure steady trade all winter.

Continued on page 40

Spot Diseases of the Apple Causing Much General Confusion

By Charles Brooks and D. F. Fisher, U. S. Department of Agriculture. Read by Mr. Fisher before the Washington State Horticultural Association.

THERE is so much general confusion in regard to the nature, cause and methods of treatment of the various spot diseases of the apple that it has seemed desirable to present a progress report of our studies of these diseases. While we still have very much to learn about these various troubles, it is hoped that what we have already found out may prove of value to the horticulturist and help him to distinguish between the different diseases, that he may shape his control measures accordingly. The disease known as bitter pit is referred to under various names. The Germans were the first to describe the disease and called it "stippin." This name is now in quite general use in New York State. In the United States the disease was first referred to as Baldwin Spot, since the Baldwin was found particularly susceptible to it in New England. This name was first used in Vermont and is in quite general use throughout the country. The disease has been referred to in New Hampshire and Oregon publications as "fruit pit." In England, South Africa and Australia the disease is known as "bitter pit." This term has also been quite generally used in the correspondence of the U. S. Department of Agriculture. The term "pit" seems much better suited to describe the disease than that of "spot," since it is set off from a number of fruit spots by a definite pitting or depression of the apple surface. It also seems desirable to eliminate the word "Baldwin," since to use it conveys the impression that the disease might be confined to the Baldwin variety, whereas the Grimes, Northern Spy, Yellow Bellflower and other varieties are just as susceptible as the Baldwin. This disease has received more attention in recent years than formerly, partly because the other diseases have been brought largely under control by spraying, partly because there is a greater demand for high-grade fruit of good keeping quality, and partly because the methods that have been adopted for producing extra fancy apples tend to increase rather than decrease this particular trouble. It has been extremely difficult to find out the cause of the disease. In the first place, it is of physiological nature, and its occurrence is determined by the general condition of the tree and fruit, and such general factors as these are hard to control in a way to get definite data.

Secondly, there has been a great deal of confusion in regard to the disease because there are a number of very similar spots that have been referred to under the above names, but which differ from one another in nature, cause and means of control. This makes any general statement in regard to the disease of questionable value unless there is a careful description given of the trouble under discussion. Among these similar spots are the

"Fruit Spot," "Jonathan Spot," "Stigmonose," true bitter pit, and the corky pit, or so-called "drouth spot." The fruit spot is characterized by hard, sunken, green or red spots with numerous black specks scattered over the sunken area. It is a fungous disease and is readily controlled by spraying with fungicides. It has never been reported west of the Rocky Mountains, and so far as Washington State is concerned, the disease can be left out of consideration. In spite of this fact, in some cases orchardists in the West have carried on extensive spraying work for the control of bitter pit, following up the Eastern directions for fruit spot, and thinking they were fighting the same disease.

Jonathan Spot is the name applied to very shallow black or brown spots in the skin of the apple. In late stages the spots may become sunken and part of the adjacent flesh involved. Various fungi may gain entrance and hasten the enlargement of the spots. In the West this disease is not generally confused with bitter pit. In some quarters it has been attributed to arsenical spray injury, but this theory of the cause of the trouble has been definitely disproved by the extensive spraying experiments which the Department of Agriculture conducted in the State of Delaware in 1910 and 1911. Blocks of Jonathans were sprayed with different amounts of

lead arsenate to see if the prevalence of the disease could be correlated with the amount of lead arsenate used in the spray. Data was secured on the disease both at the time of picking and after several weeks in storage. No correlation whatever could be found between the arsenate of lead and the disease. In many cases there was more disease on fruit which had not been sprayed at all than upon that which had received the heaviest application of lead arsenate. The disease is of a physiological nature, and is essentially a storage trouble, and therefore is not controllable by spraying. It is greatly reduced by hastening the fruit to cold storage. Our experiments with this disease seem to indicate that factors similar to those involved in the cause and control of bitter pit are closely paralleled in the case of Jonathan spot. These will be taken up in more detail in the consideration of bitter pit. Jonathan spot does not seem to be a desirable name for this trouble, since it implies that the disease is largely confined to the Jonathan variety, whereas Spitzenberg, Yellow Newtown and other varieties are often as badly affected. In the interest of clearness it would be desirable to eliminate, if we could, the name of any particular variety of fruit from the names of diseases. The term "freckles" has been applied to Jonathan spot, but it has not

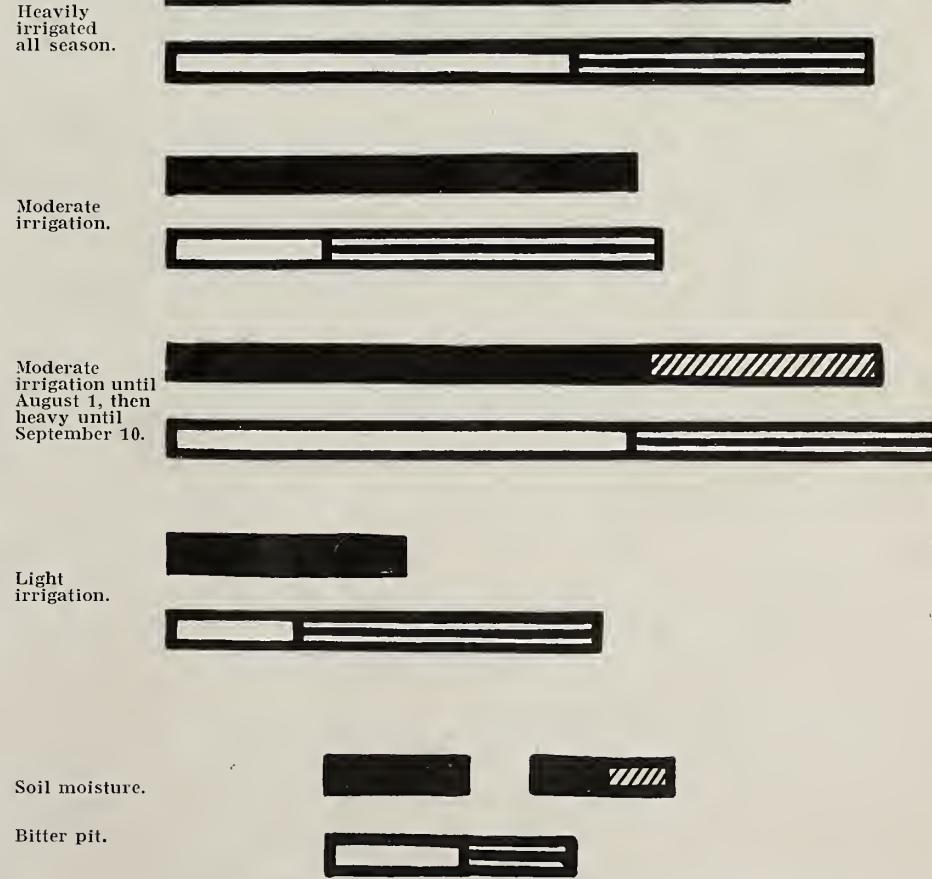
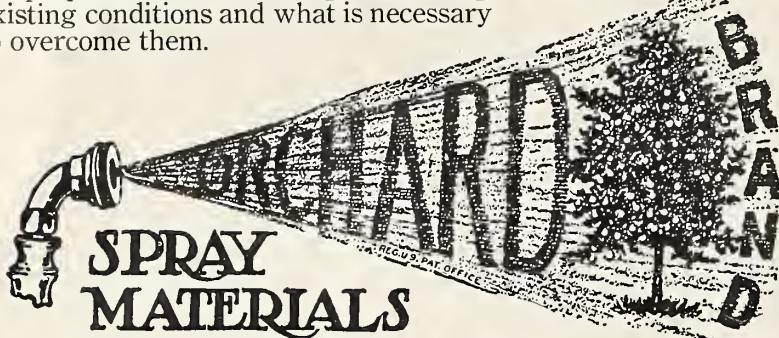


Chart showing correlation between soil moisture and bitter pit in 1915 experiments on Grimes at Wenatchee, Washington.

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come into general use, so it will perhaps be best to adhere to the commonly-accepted name of the disease.

A great deal more confusion has arisen in regard to the other diseases mentioned above: the true bitter pit, the corky pit or drouth spot, and the stigmonose. These troubles resemble one another very closely in some cases. The true bitter pit appears on mature, or nearly mature fruit, either on the tree or in storage. When found on the surface it causes hemispherical depressions, usually rather circular and uniform in shape. Beneath the skin brown dry spots are found, and this brown tissue may extend down through the flesh of the apple along the conducting vessels, giving the flesh a streaked appearance. Pits may also be found at a depth in the flesh when there is no outward indication of their presence. The pitting is generally confined to the lower or calyx end of the apple.

The corky pit or drouth spot usually has a fairly large area of dead brown tissue. These spots may be near the surface or at a considerable depth. They may appear at any stage in the growth of the apple, but usually become more evident later in the season. At first they are large, irregular shaped, water-soaked spots, often stained a reddish color and usually covered with drops of a yellowish, sticky ooze which is sweetish to the taste. In late stages of the disease the fruit is much misshapen, the spots become very hard and

sunken, while the flesh is brown and corky like an old bruise. In 1913 this disease was first produced experimentally at Wenatchee by subjecting Winesaps to a sudden and severe drouth. In every case since observed it has been found that this condition prevailed before the appearance of the trouble. It was at first thought that these spots might possibly be due to water being turned on suddenly after the drouth, but later observations have shown that they developed before irrigation was again resumed. There is no question but that a sudden shortage of water is the direct cause of the spots. It is probable that the character of the soil may have a modifying influence. The disease is most common on Winesaps, although Staymans and Ben Davis are often affected. Varieties other than these have been subjected to the same circumstances and the fruit reduced to a decidedly shriveled condition without these corky spots appearing. In the East the Ben Davis seems to have suffered more than other varieties from this trouble. The best remedy that can be offered with our present knowledge is that of uniform watering. There is another form of corky pit that occurs on shallow soils in some sections of the East and West. It is common where there is a hardpan at a slight depth, and also where there are peculiar soils outcropping. This disease is quite generally associated with rosette. The remedies that have been suggested are

such as tile drainage, blasting and turning under cover crops.

Stigmonose is a term used to refer to insect injuries to plants. It is used here to refer particularly to the effects produced on apples by sucking insects. The gross characteristics of stigmonose are very similar to those of true bitter pit. The spots, however, are more irregular in size and outline than those of bitter pit, and instead of having a rather smooth, hemispherical depression of the skin the stigmonose is usually a roughened and irregular pitting. It appears earlier in the season than bitter pit and is usually found particularly abundant on those branches where aphids are of most common occurrence. It is not confined to the middle or calyx end of the apple, as is usually the case with true bitter pit. It also differs from bitter pit in that it is seldom found deep in the flesh and that there is no streaking beneath the spots. Our first year's work in Washington State was practically wasted, so far as results on bitter pit were concerned, because experiments were outlined for this disease and carried out in orchards which it had been reported to us were badly affected with bitter pit, but which we later found were affected with stigmonose and not true bitter pit. Within the last year in certain orchard sections of the East large blocks of Yorks and other varieties have been so badly affected with stigmonose that the owners, thinking they had some physiological trouble, were planning to either top work their trees or cut them out, as they despaired of ever controlling the disease. Upon examination it was found that the disease was not bitter pit but a bad case of stigmonose. While the bitter pit and the stigmonose are so much alike in appearance, the manner of control is entirely different. Stigmonose is due to sucking insects. Its occurrence runs parallel with that of the aphids, particularly the rosy-apple aphis. It is sometimes found on the small gnarled apples on the inside limbs of the tree, which have been damaged by the early attacks of the rosy aphis, but it also occurs on other apples that are near these, as well as those in other parts of the tree, and to which the aphids spread later in the season. It has to be controlled by controlling the sucking insects. In order to carry out bitter-pit experiments with stigmonose eliminated we have found it necessary to spray our experimental trees for the control of aphids. This control was accomplished this past year through the co-operation of Mr. E. J. Newcomer of the Bureau of Entomology, who has been associated with us in the stigmonose experiments. We found in one of our experimental orchards, where rosy aphis was particularly abundant, that spraying with Black-Leaf 40, diluted 1-1000 plus lime-sulphur testing four degrees Beaume, and applied just as the terminal buds were becoming green, reduced the amount of stigmonose from 16 to less than 1 per cent. True bitter pit does

not usually appear until the fruit is nearly mature, and often develops in storage, particularly where improper methods are used. It is worse on large apples and on fruit from young trees. Irrigation is a very important factor in its control. In our experiments on this disease it has been found that heavily-watered trees, particularly those watered heavily late in the season, have a much greater percentage of diseased fruit than those receiving medium or light watering.

The following data, showing the percentage of bitter pit present, has been obtained in experiments of the past year on Grimes variety, counts being made twelve days after picking:

Heavily watered throughout the season.....	43%
Medium supply of water throughout season	17%
Medium supply of water until August 1, then heavily watered.....	49%
Lightly watered throughout season.....	14%

After six weeks in cellar storage the amount of disease (bitter pit) had increased to the following percentages:

Heavily watered throughout season.....	73%
Medium supply of water throughout season	54%
Medium supply of water until August 1, then heavily watered.....	81%
Lightly watered throughout season.....	40%

These results are graphically presented on the accompanying chart, where the soil moisture is expressed in per cent of soil saturation as determined by frequent tests throughout the season. It might be noted in a consideration of the above figures that the results were obtained from five-year-old trees of a very susceptible variety. Practically the same contrasts were obtained in another similar experiment using Jonathans instead of Grimes. Our results in this case differed from the above only in the relative smaller amount of disease occasioned by the differing susceptibilities of the varieties. The production of Jonathan spot, so far as it has thus far been determined, closely parallels that of bitter pit in these experiments. It is evident that bitter pit can be largely reduced in irrigated sections by the proper

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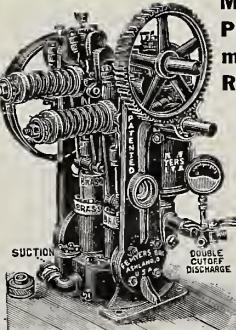
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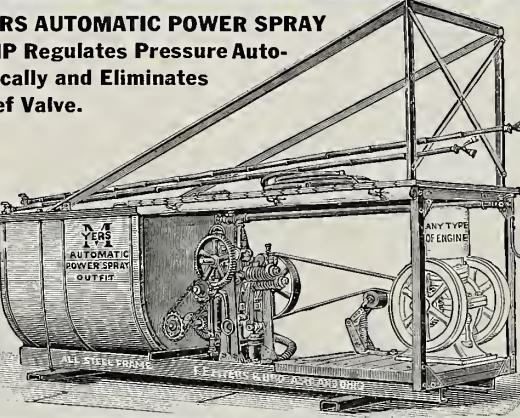
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handling of the irrigation water. There are other factors concerned, however, but our experiments do not justify a report on these at the present time. In storage the disease is partially prevented, or at least delayed in appearance, by prompt cooling. This report on these diseases is not given as a final statement on the subject, as there is yet much to be found out, but there are a few things of practical importance that can be definitely stated. The fungous fruit spot of the East does not occur in Washington, and sprayings with fungicides for spot and pit troubles are unnecessary. Jonathan

spot is a skin disease of a physiological nature. It appears most often after the fruit goes into storage and is not controlled by spraying. Stigmonose is of common occurrence, has been much confused with true bitter pit, and can be controlled by controlling the sucking insects. The control of corky pit or drouth spotting should be attempted along lines of soil improvement and maintaining a uniform water supply. True bitter pit can be greatly reduced by proper handling of irrigation water, that is, by avoiding excessive irrigation, especially late in the season, and by hastening the fruit into cold storage.

Alfalfa in the Orchard, or Better Orchard Farming

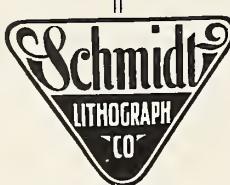
By P. S. Darlington, Horticulturist, Wenatchee, Washington.

UP until the last two or three years prices for our Northwestern apples have been good. So good in fact that our fruit farmers of Washington have made good big profits and have done well in a business way, regardless of whether they have conducted their farms upon good, sound business principles or not. We are inclined to lay most of our troubles in the last two or

three years to marketing conditions. As a matter of fact adequate marketing facilities have not kept pace with the rapidly-increasing tonnage of the Northwest. However, in the last year or two a great deal has been said and done along the line of improving our pack, grade, and marketing conditions in the future. But none of us can foresee what prices we are likely to

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get for our fruit in the next few years. We must hope for the best but be prepared for the worst. On our orchard farms we must start building up a better and more permanent agriculture, an agriculture based upon more economic principles. I mean by this that we can no longer afford to take crop after crop from our orchards without doing something toward improving or at least maintaining proper soil conditions. We can no longer afford to go to town and buy our meat, butter, eggs and garden produce, as has been largely the practice in the past. By building a better agriculture, then, I mean maintaining and improving soil conditions, maintaining and improving crop production, both as to quantity and quality, and living better and more economically on our orchard farms.

If one will take a ride through the older orchard sections during the summer time he can see here and there orchards in which the trees show small, yellowish and sparse foliage, a red or yellowish bark, and probably a light crop of small apples. These are symptoms of improper nourishment or partial starvation. This condition may be brought about by any one of a number of different causes, but whatever the cause the effect is partial starvation. In some cases it may be due to lack of water, but since all plant food must be taken up in the form of solution lack of water is starvation. In a light sandy soil it may be due to too much water, in which case the soluble elements of plant food are leached away before they can be utilized by the tree roots. It may be due to an impoverished soil, but there are comparatively few of our orchard soils but what contain sufficient plant food to properly nourish the trees if the elements of plant food that are in the

soil are made available to the trees. This starved appearance is most frequently due to the fact that the elements of plant food which are in the soil in abundance are, on account of the improper physical condition of the soil, not made available to the tree or plant.

An ideal apple soil is a heavy rich loam. But this type of soil as well as other types, if clean cultivated for a period of years, becomes void of humus or organic matter. The soil particles then readily run together. In this condition the soil breaks up cloddy. It puddles easily when wet. It does not take water readily. In fact a strata just beneath the surface cultivation will develop which is almost impervious to water and which is almost as hard as hardpan. A soil in this physical condition, though it may be ever so rich in the elements of plant food, will not release or make available to the tree plant food in sufficient quantities to properly nourish the tree. This condition of soil has been brought about by the continuous burning up and almost continuous exhaustion of the humus or organic matter in the soil. This is the result of continued clean cultivation without the addition of organic matter to the soil. The point that I want to bring out most forcibly here is that our soil troubles are mostly physical rather than chemical, and that the addition of chemicals in the form of chemical or commercial fertilizers can do little toward the permanent upbuilding of our soil conditions. Furthermore, without an adequate supply of humus we do not get full benefit of whatever chemical fertilizers we may use.

We may temporarily benefit a crop or our trees by deep plowing or by dynamiting. By such means the soil

is temporarily put in better shape to absorb water. But such results can be only temporary, for without organic matter in the soil to hold the soil particles apart the soil will soon run together and become as compact and as impervious to water as before. To build up and maintain a constant supply of available plant food with the least possible waste we must have a goodly supply of humus in the soil. Humus is decaying vegetation or organic matter. Humus acts as a sponge to not only hold moisture but to hold available elements of plant food. In the decomposition of organic matter various weak acids known as humic acids are formed. These weak acids have a dissolving effect upon the soil particles and change the otherwise unavailable elements of plant food into available form. Humus holds the soil particles apart and prevents the soil from becoming hard and compact.

Now we come to a discussion of correcting the physical conditions of the soil, a discussion of supplying humus in the best and most economical way. We all know something of the benefits of barnyard manure. Barnyard manure

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is not very rich in the elements of plant food. For instance, 66 pounds of nitrate of soda furnishes as much nitrogen as a ton of ordinary horse manure; 20 pounds of muriate of potash furnishes as much potash as a ton of ordinary horse manure, and 25 pounds of ground bone furnishes as much phosphoric acid as a ton of ordinary horse manure. I can readily point to a number of orchards which have shown very plainly the beneficial results from barnyard manure, due probably more to the beneficial physical effect upon the soil than to the comparatively small addition of plant food. However, barnyard manure is expensive, especially if we have to haul it from town, and we cannot all get it in sufficient quantities. Therefore we must turn to other sources of organic matter. This brings us to a consideration of cover crops. By a proper system of cover or manure crops we can undoubtedly furnish the required humus more cheaply than in any other way. In fact the negligent grower, as we used to call him, who allowed the weeds to grow in his orchard every fall and worked them into the soil in the spring and continued this practice year after year has today very much better soil conditions than the grower who has scrupulously clean cultivated over the same period. The weeds have not added any fertility to the soil, but they have kept the soil in better physical condition. Wheat and rye are sometimes used with beneficial results, especially on light or sandy soils which are likely to shift with the spring winds. But these, like the weeds, add no fertility, simply put

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back what they have taken from the soil. It is now a matter of common agricultural knowledge that there is a family of plants known as the legumes that do have the power of adding fertility in the form of nitrogen to the soil. Since nitrogen is the element of fertility that is most likely to be lacking in most of our soils and is the element that is the most expensive to buy, and since we find among the legumes plants that are suitable in many other respects for cover or manure crops, it is natural to expect that we should find our most suitable cover-crop plants in this family.

Red clover has long been used as a green manure crop and is highly recommended in general farming districts for such purposes. It has been quite generally recommended for an orchard cover crop and has been quite extensively used in the fruit districts for that purpose. However, results from its use as an orchard cover crop, at least in the Wenatchee district, have not proven generally satisfactory, especially where the clover has been allowed to remain in the orchard for two years or more. This same appearance of starvation as described above usually becomes very apparent after clover has been in the orchard for two years or more. I could cite numerous instances of this condition. Red clover is a shallow-rooted plant. It takes its supply of water and food from the first two or three feet of soil right in competition with the feeding roots of

the tree. While I have no exact measurements of water used it is conceded by practically all that have had clover in the orchard that it requires an excessive amount of water. I believe that the generally poor results from the use of clover are due to the difficulty of keeping a proper degree of soil moisture.

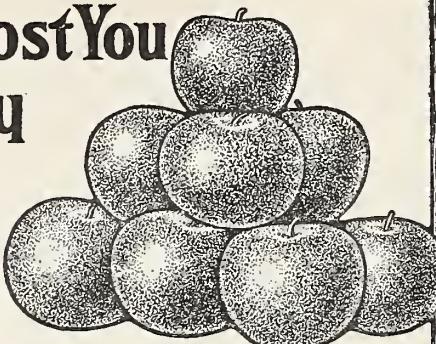
Hairy vetch has a good deal in its favor as a cover crop. It is one of the best nitrogen gatherers, it produces a great mass of vegetative matter and reseeds itself year after year. Orchards that have continued the proper use of vetch year after year show excellent results from its use. I understand that the price of vetch seed at the present time is prohibitive.

I consider alfalfa far superior to any other crop that we now use for cover crop or green manure purposes in our orchards. Alfalfa produces an immense mass of vegetative matter, not only above ground but also below. I believe that it is unexcelled in this respect by any other crop that we can grow in our orchards and, as explained above, it is vegetative matter in the soil that we need more than anything else. Alfalfa is a soil renovator. It is a more successful soil renovator than plow or harrow, or even dynamite. No plow sole forms in an alfalfa field nor in an orchard sowed to alfalfa. Alfalfa roots penetrate the soil to the depth of 20, 30 or 40 feet and have been known to go down to a depth of 127 feet. The decaying roots and side laterals of the

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which are Ben Davis. The Z. A. Lanham orchard is, as near as I can learn, the same age. And as near as I can learn, it had been continuously clean cultivated up until the summer of 1909, when it was sowed down to red clover, and remained in red clover for three years. This orchard contains 833 trees, about two-thirds of which are Ben Davis. This orchard has had good care and apparently better natural soil conditions and location than the Barney & Williams orchard. Below is a comparison of the two bearing records, both of which are exceptional records:

BARNEY & WILLIAMS (ALFALFA)

Year	Boxes
1907	2,300
1908	2,500
1909	3,031
1910	3,300
1911	2,894
1912	3,036

Total for six years..... 17,061
Annual average (150 trees).... 2,343
No. boxes per tree per year.. 19

Z. A. LANHAM (CLEAN)

Year	Boxes
1907	5,500
1908	10,000
1909	5,500
1910	11,500
1911	5,500
1912	13,000

Total for six years..... 51,000
Annual average (833 trees).... 8,500
No. boxes per tree per year.. 10.2

While these two bearing records may not be conclusive evidence of the effect of alfalfa upon production, they would seem to indicate that at least alfalfa is not harmful to production. I could cite the case of the Bailey orchard just across the road from the Barney & Williams orchard. This orchard produced two or three good big crops, then began to fail. The foliage became pale and sickly looking and small and sparse. For two or three years following this orchard produced small crops of small apples. It was then sown down to alfalfa. The second year after the alfalfa was sown this orchard produced broad dark-green foliage and a good crop of large apples, and continues to produce good crops. From such observations as these and many others I am forced to believe that alfalfa is beneficial in the orchard. But alfalfa has another advantage. It ranks high in feeding value. In fact we are told that a ton of alfalfa hay has almost as much feeding value as a ton of wheat bran. Where it is possible we might just as well get the feeding value out of it as well as the fertilizing value. Now does all of this mean anything? Yes, this is what it means: Every orchard farm should have at least one family cow, a hog or two, some chickens, etc. We would then have our own milk and cream, butter and eggs and meat, which with what vegetables we can raise in a small corner would constitute a large portion of our living. We would live much better and a good deal cheaper and would at the same time be building up our orchard soils. This is what I call building up a better and more permanent agriculture on our small orchard farms.

alfalfa keep the soil open and porous for the penetration of air and water. Alfalfa is a legume and therefore a nitrogen gatherer. It is probably not excelled as a nitrogen gatherer. But it does more than gather nitrogen from the air—it penetrates the soil far below the reach of ordinary plants and brings up other elements of plant food and makes them available at the surface. It has been estimated at the New Jersey Experiment Station that the amounts of plant food gathered by a test acre of alfalfa in two years were, nitrogen equivalent to that contained in 3,500 pounds of nitrate of soda, phosphoric acid equivalent to that contained in 600 pounds of bone, black superphosphate and potash equivalent to that contained in 1,200 pounds of muriate of potash. This amount of fertilizer purchased at the ordinary cost of commercial fertilizer would cost about \$124, the nitrogen alone being worth about \$105, and this was taken almost entirely from the air. Alfalfa permits of cultivation in the spring when the surface soil should be stirred and allowed to warm up. The soil may thus be put in better shape to conserve the winter moisture. Cultivation does not injure but helps the alfalfa itself. I have no accurate data on the amount of water required for alfalfa in the orchard, although I have made a good deal of observation and inquiry along this line. I am satisfied that if three crops of alfalfa are cut and taken off the land that it will

require more water than clean cultivated land, although I believe that land that is clean cultivated year after year will eventually get in such physical condition that it will be necessary to run more water over the surface of the soil to get it properly soaked in than it requires to produce the alfalfa. I am very thoroughly convinced that alfalfa requires considerably less water than red clover.

I have mentioned all of these as reasons why alfalfa should give good results as a cover crop. Now let us see what it actually does. Some of the most vigorous as well as some of the most productive orchards in the Wenatchee district today are those that have had alfalfa in the longest. I could point out a number of such instances. But for the sake of comparison I have gotten the bearing record of the oldest alfalfa orchard that I know of in the Wenatchee district. This bearing record covers a period of six years. I have also gotten the bearing record of another orchard of the same age and largely the same varieties. The Barney & Williams orchard is now about 18 years old. It was originally an alfalfa field plowed up and set to orchard. So far as I can learn an effort was made for the first few years to keep it clean cultivated, but the alfalfa was eventually allowed to take it, so that this orchard has probably now been in solid alfalfa for 14 or 15 years. This orchard consists of about an acre and a half and contains about 150 trees, most of



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Diversity of Fruit Growing

Professor C. I. Lewis, Chief Division of Horticulture, Oregon Agricultural College, Corvallis, before the Oregon State Horticultural Society.

WE have recently completed a study of the cost of production of apples in a thousand orchards in the Pacific Northwest. In making this study, we gave special attention to the subject of the possibilities of diversifying the fruitgrower's interest. We realize that the production problem simmers itself down quite largely to the proper utilization of labor and teams and the maintenance of an acreage which guarantees cheap production. The amount of diversification that a man can undertake depends very largely upon the acreage of fruit which he maintains and the amount of capital, time and general facilities at his disposal for other lines of endeavor. Possibly, the best form of diversification for the fruitgrower is to diversify more in his own line. Namely, instead of devoting his entire attention to the production of one type of fruit, such as apples, or walnuts, it would be better that he grow a number of types, thus distributing his labor and bringing in cash incomes at various seasons, and eliminating to a certain degree the possibility of lean years. For example, in the Willamette Valley, if he has a prune evaporator, blackcap raspberries or loganberries, prunes and English walnuts could all be dried in the same building and would not interfere with each other. For the slack time which would come in August, he could have Bartlett pears raised for the cannery, or he could take such a combination as berries, prunes, apples or walnuts. In a section like Hood River one could grow such crops as strawberries, cane fruits, cherries, pears and apples. For The Dalles, early berries, cherries, peaches, apricots, green prunes, grapes and some truck-garden crops. For the Freewater-Milton district, dewberries, strawberries, early garden-truck crops, peaches, green prunes and apples. These are merely some of the crops to raise. Others could be raised, and we could work them out for different sections of the Northwest.

To the fruit grower who contemplates taking up general agriculture in connection with fruit growing, I would

warn him against overdoing this proposition, for, unless he makes a careful study of the proposition and is a good business man, he will only lose money, rather than add to his receipts. The great danger to a man who goes into general farming and at the same time attempts the production of fruit, is that his fruit will be of very poor quality. Often Western people point to the diversity of certain Eastern fruitgrowers, but they fail to remember that these same Eastern fruitgrowers produce very ordinary fruit—fruit that would not pay a Western fruitgrower to pay the freight on. It is very doubtful if, on high-priced land, there is a single agricultural production that will pay better than fruit properly grown, and the man contemplating diversification needs to give a little attention to the question of cheap production and efficient business management. On the other hand, the general farmer should go into fruit growing cautiously. There are some exceptions, however. The prune, for example, can be grown very nicely by the every-day farmer and is today the best cash crop on a large percentage of the farms in the Willamette and Umpqua Valleys. The longanberry is another crop which the dairyman or general farmer can grow in connection with other crops, and the English walnut offers a fair field. Occasionally we find a man handling peaches and canning pears successfully, but there are very few general farmers who make a success of apples, pears and sweet berries. Every orchardist should attempt to produce as large a percentage as possible of food consumed on his ranch. This means he should keep a good family cow, at least one pig, a small flock of chickens, and should maintain a good garden in which will be found abundant supplies of asparagus, rhubarb, small fruits, potatoes and seasonable vegetables. From such a combination he ought to be able to sell a considerable excess to advantage.

We will now consider the various opportunities for diversification, and the first we will consider is that of

forage crops in irrigated sections. For example, clover and alfalfa and similar crops can be easily grown in the mature orchards. Our survey, however, points out that when these crops are produced as hay, very little money can be made, and that the most money from these crops is realized when they can be pastured by such animals as hogs or sheep. Sections fortunately situated near good markets can engage to a limited extent in the production of high-grade truck-garden crops. However, the market is limited and it is only occasionally where one can realize money under conditions where it is necessary to employ practically all the hand labor. For irrigated districts, the strawberry has shown itself to be the best money producer. We must admit that sometimes it is a little hard on the trees, but there are many fruit-growing sections that would be better off if they always reserved a portion of their land for the production of such fruits as the strawberry. The potato on the whole has not been very profitable. Occasionally an orchardist makes money, but more of them lose. In only a small proportion of the orchards do we have the right combination of soil and climate for good potato production. A few growers producing seed potatoes have made money. Some of the men in the Grand Ronde Valley have done well in this way. It is very rarely that grain or grain hay can be grown profitably among fruit trees.

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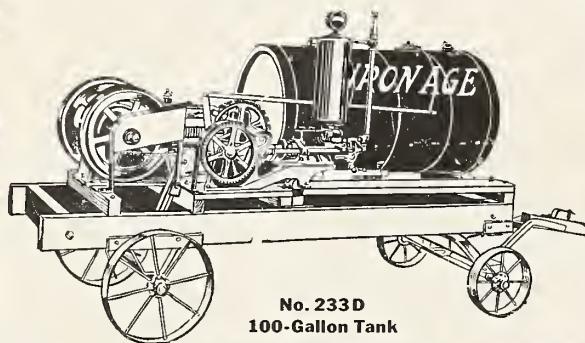
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The greatest value of the grain would be to check over-vigorous trees that are not bearing, but which should be producing commercial crops.

When marketing conditions are right, the hog represents one of the best propositions for the fruitgrower to consider. This is especially true in Western Oregon, where abundant crops of turnips, vetch, rape, etc., can be grown as winter pasture and where the soil will stand such pasturing. The hogs are turned off in the spring. Where cheap grain, such as wheat screenings can be procured, hogs have been produced very satisfactorily by some of our orchardists. Where summer pasturage must be resorted to, the question is a little more complicated and the grower is often forced to unload his pork on a very poor market. However, in some of our experiments we have secured very satisfactory results. In a test which we tried at the Umatilla Experiment Farm, at Hermiston, the following results were secured:

For the purpose of determining the comparative value of alfalfa hay and pasture produced by equal areas of land planted to orchard, one-half acre of four-year-old alfalfa was taken. The soil and stand of plants were uniform and no grading was done preparatory to seeding. The tract was equally divided into one-fourth-acre fields, one-half being set aside for the production of hay and the other fenced for pasturing. The pasture plat was divided into two parts of one-eighth acre each. A

small shelter and water barrel were placed at one end of the dividing fence in such manner that by changing the free end of one panel from one end to the other of the shelter they could be thrown into either of the plats. Owing to the flume leading to this land being small, water could not be applied to the entire experiment at one time, but it was irrigated regularly at intervals averaging about twelve days in length. New furrows were made in the hay ground after each crop was removed, and in the pasture plats before each irrigation. Four crops of hay were cut from one-fourth acre, which yielded as follows: First crop, May 22, 848 pounds; second crop, July 6, 838 pounds; third crop, August 3, 534 pounds; fourth crop, September 28, 430 pounds. Total 2,650 pounds, or 5.3 tons to the acre. A yield of 5.3 tons is considered large for coarse sandy soil not influenced by ground water.

The first lot of hogs purchased for use in this experiment were farrowed September 15, 1913, making them 194 days old. They were from the first litter of a young Duroc sow. The sire was of the large type Poland China and both parents were of good breeding. Hogs of the second lot were very similar in every respect to those of the first. Although not large for their age, they were thrifty and in good flesh when put on the pasture. Total number of days alfalfa was pastured, 190; number of hog days for one acre of alfalfa, 3,040; total pounds pork pro-

duced by one-quarter acre of alfalfa with addition of grain equals 573, which is equivalent to 2,292 pounds to the acre. At seven cents this amounts to \$160.44. After deducting \$28.25, the cost of 1,883 pounds of grain (rolled barley) fed at \$30 a ton leaves \$11.86 to the credit of one-quarter acre of alfalfa. This equals a rate of \$47.44 an acre for the alfalfa by pasturing under the above conditions which were no more favorable than are found on several farms on the project at the present time. At \$7 a ton, which is the sale price of loose hay, an acre income of \$37.10 was received. The value of each ton of hay in terms of alfalfa used as pasture, in view of the above results, would amount to \$8.95. At \$7 a ton for hay, and \$8.95 a ton for hay when used for pasture, gives an increase in value of \$1.95 a ton, or \$7.80 an acre for pasture over that of hay. During one week in April small amounts of alfalfa were cut from an adjacent field and fed to the hogs on account of cool weather checking the growth of forage on the pasture plat. No record was kept of the quantity used, but as it was very small it would make only a slight difference in results of the experiment.

In the above figures no estimate or consideration is made of the comparative labor requirements in producing hay or pasturing. From the farmer's point of view the pasturing gives a better distribution of labor and, if somewhat more expensive in amount required, being more evenly distributed, would, on many farms, be cheaper than the irregularity and inconvenience of gathering haying crews for short periods of service. The value of retaining the organic matter resulting from grain fed and forage produced upon this land and having it well distributed over the surface in the form of manure is an item of considerable importance in this district.

All that can be gained in buying grain in quantity is clear profit. In order that the greatest profit can be had from pasturing, grain (which is necessary for maximum returns) should be bought directly from the producer and in large quantities. Where a return of \$47.44 an acre was got for alfalfa pastured by feeding grain at \$30 a ton, a saving of \$37.68 would have been made by feeding grain at \$20 a ton, and an acre return of \$85.10 realized. From 1.5 to 2.5 pounds of grain should be fed daily for every 100 pounds of live weight. One and one-half pounds, or 1.5 per cent was fed in this experiment. For the comfort, protection and health of the animals substantial shelter should be afforded and the quarters kept clean and well disinfected. Fresh water and some form of mineral matter should be kept available at all times. A combination of soft coal, or charcoal, salt and a small amount of sulphur, kept in a small trough in the lot, is valuable to keep the animals in good thrifty condition. The grain should be fed twice a day and the animals frequently

changed from one plat of alfalfa to the other to keep them on succulent feed and get a maximum growth of forage. If not fed down closely, the alfalfa stubble should be clipped as soon each time as hogs are removed.

In a Hood River experiment this past summer, thirteen hogs, Duroc, averaging 73.5 pounds, made a total gain of 241 pounds in 32 days. This amounts to individual gain of 18.5 pounds and an average daily gain of .57 pounds per hog. This gain was made on clover pasture alone. For a thirty-day period on clover with .5 pound grain (rolled barley) per hog per day they gained 13.8 pounds per hog, or .44 pounds per day. During a 58-day period on the same clover and field peas which were mature, the same hogs made a total gain of 44.8 pounds, which amounted to a daily gain of .77 pounds. For a the period of 120 days these animals made a daily gain of .64 pounds, amounting to an individual gain of 77.2 pounds and a total gain for the period of 1,004 pounds. As the hogs were of excellent stuff for such an experiment they no doubt did well under the conditions, however they did not have sufficient grain to make maximum gains. With about 2 per cent of grain they should have made 1 pound gain a day. As they ran over three acres of clover and fed off four acres of peas in company with twenty head of smaller animals, it is impossible to determine what income they yielded per acre of clover, or of peas.

The question is sometimes asked, will not the hogs damage the trees? Yes, quite frequently they will injure young trees, and there are certain individuals that need watching or removing from the orchard. However, if there is an abundance of feed and good varieties, there is less danger. If the apples get heavy enough so as to bring the branches near the ground, hogs will often shake off large quantities of fruit. One should not try to over-class the orchard. The cull fruit is of questionable value. It is, however, worth something, but is poor for fattening.

It is exceedingly hard for an orchardist to engage in dairying on a large scale. There are a few exceptions, however. For example, a man who has abundant pasture and can raise plenty of feed, sell his milk at retail prices, and provide proper barns and pasture for his stock, will often make money. His herd, however, must be superior and he cannot afford to buy much of the food the cattle consumes. An orchardist can often make very good money on from one to three cows, and begin to lose money when he attempts more. The average cow which the dairyman offers the orchardist is of very questionable value. Very few men are temperamentally suited to handle both fruit and cows successfully.

A small flock of chickens should be found on every orchardist's ranch. It is only in exceptional cases, however, where large flocks of chickens will pay. If large numbers are kept, it

requires much attention, and most orchardists feel that the element of grain is a factor which keeps them from going into the industry extensively.

I have felt that possibly it would pay some of our orchardists who have good crops of clover and alfalfa to attempt sheep fattening. There are sections of the Northwest where sheep can be secured in the spring of the year quite easily. There are other sections where people would be glad to lease pasturage. We have tried an experiment with sheep this past year at Hood River, but hope to try it more extensively in the future. The report of this year's experiment is as follows: Eight head of ewes with lambs can be handled on three acres of good clover in orchards. The ewes made practically no gains, as they suckled the lambs throughout the determination. Our figures show that eight head

suckling lambs that averaged 26 pounds when put on clover with mothers (single lambs) made an average daily gain of 1.2 pounds each for a period of 52 days. No correction has here been made to cover gaunt condition of animals at first weighing, and full condition at final weight.

Where the fruitgrower has some pasturage, raising abundant hay and grain, it will generally pay him to raise his own colts, and sell off his work horses at the time they will bring the most money, and always break in new colts for his work. It is doubtful, however, if it will pay if one has not the feed and pasture.

The Province of British Columbia is holding packing schools throughout the various fruit districts during this winter for the purpose of instructing people who want to learn how to pack apples, so they will have an ample supply of packers for the year 1916, when they expect to produce a considerably larger crop than in any previous year.

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Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

1916 Apple-Crop Estimates.—Every year there is agitation in the fruit world in the Northwest. In the winter of 1914 the agitation was all about the low prices obtained by the marketing concerns. The 1915 crop has brought the fruitgrowers good money, so they have now turned their attention to the 1916 apple crop. Many of them are busy in figuring what the crop may be. Mr. Corbalay of Spokane, Washington, sent out a number of letters to all the principal districts of the Northwest for the purpose of ascertaining the amount of bearing acreage and estimates on the yield for 1916. As a result of his investigation he gives two sets of figures for the tonnage on the apple crop in the year 1916—one minimum and the other maximum. Both were so large that many fruitgrowers have already been scared over the possible crop of 1916. The editor says "possible" advisedly. For many years the editor of "Better Fruit" has sent to the most reliable and conservative people in the Northwest, beginning early in the year, for the purpose of securing estimates for the coming season; at various times, beginning early in the winter, again at blossoming time and again after the fruit had set. The result of his observations are all worthy of consideration in connection with the estimates that are being given now for the 1916 crop. One district at this time of year has frequently reported as high as 7,000 or 8,000 cars on a conservative basis, but actually only shipping about 5,000 cars. Another district has estimated as high as 8,000 cars and in the same year shipped less than 3,000 cars. Another district has estimated 1,500 cars and not shipped over 200 cars. In 1912 one of the oldest selling agencies of the Northwest stated during

BETTER FRUIT

the blooming time that the crop of Hood River Valley would be 2,000 cars, adding "if the fruit set well." The editor of "Better Fruit" estimated the crop at about 1,200 cars, which was about correct for that year. In fact nearly every district in the Northwest has annually estimated the crop early in the season far in excess of the actual yield. The editor of "Better Fruit" has contended that no estimate should be given out at this time of year, or at blossom time. In fact estimates should not be given out until after the June drop is over. The editor has seen many orchards that in blossom looked like a snowbank that did not produce half a crop. The editor has seen many orchards with a splendid set of fruit before the June drop produce only 50 per cent of a crop. These bumper yields that everybody talks about have only come twice in the last twenty years—in the years 1896 and 1914. It is impossible to estimate a crop of apples with any degree of accuracy at this time of year. In fact it is impossible to estimate a crop with any degree of correctness until after the June drop. Even then it is impossible to estimate the crop of commercial apples that will be shipped, due to the fact that heavy losses may occur after that time from scab and from codling moth, which occurred last year, damaging 30 per cent of the crop of the Northwest, making it unfit for commercial purposes. There is no reason why fruitgrowers of the Northwest should cross a bridge before they get to it. There is no reason why they should be scared before they are hurt. On the other hand, there is every reason why every marketing organization should prepare for handling a probable or possible crop to the best of their ability in advance. The value of preparedness is thoroughly illustrated more forcefully by the war in Europe than by any other thing that has ever happened in the world. A man today can no more guess the apple crop of the United States, or of the Northwest, for 1916 than he can guess correctly when the present war will end. At the beginning of this war financiers of Wall Street, who are the ablest of the United States, closed the Stock Exchange on the ground that if it was kept open that Europe would unload United States securities on this country so rapidly that it would shake all values and drain the United States of gold. When the Stock Exchange opened, values remained at par, and instead of Europe draining the United States of gold, gold has continued to pour in from Europe, so that at the present time the United States has more gold than any other nation in the world. If the financiers of Wall Street are unable to predict any more correctly than this it does not look wise to give out estimates of so uncertain a thing as the apple crop this time of year, because we all know that when once big estimates are given out these impressions cannot be eradicated from the trade, and we all know that if the

impression exists that the crop will be heavy that it is the most demoralizing opinion that can exist in affecting values. So the editor of "Better Fruit" says go slow on giving out estimates of the crop of the Northwest until the apples are half grown and you know what you will have instead of guessing at it. No exception can be taken to figuring on probabilities and preparing ourselves to handle any possible crop that may be harvested in 1916, but mighty good judgment should be used about giving any figures on estimates at this time of year wide publicity.

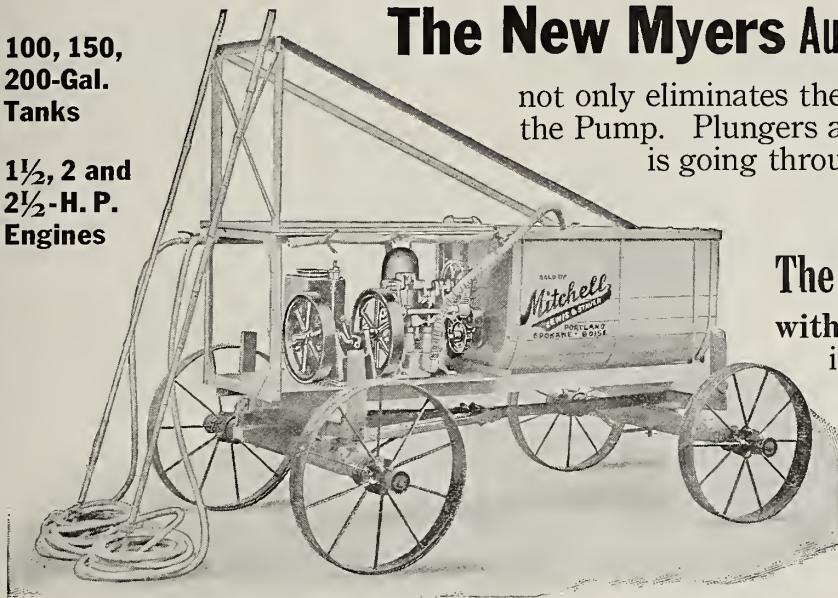
Selling Organizations.—The Northwest has been passing through a great evolution in determining a marketing system adequate to handle the crops of the Northwest. After three years' experience it appears that no single organization has been able to control over 50 per cent of the tonnage. In nearly all of the different fruit districts there has existed for a number of years a number of selling concerns which, apparently, have established themselves so firmly that they have continued to hold about the same percentage of tonnage during the last few years as they held before any plan for one general marketing organization was undertaken. Inasmuch as the situation at the present time does not indicate that any of these marketing concerns will go out of existence, and for the further reason sufficient progress has not been made to indicate that in the near future any one marketing concern will control the entire Northwest, which is claimed by many would be ideal, but we will not argue this point. It seems that at the present time our policy should be, first, to prevent any increase in the number of marketing concerns. There is already enough competition. Second, we should support and maintain the present marketing organizations, particularly those which are giving the growers satisfaction. Third, that every fruitgrower should use his influence to persuade all fruitgrowers to go into one of the good existing marketing institutions, strengthening them in every way possible. It is the universal opinion of all men connected with existing marketing concerns that prices have been affected more seriously by irregular shipments, lack of orderly control and independent consignments of individuals who possess little or no knowledge of the markets to which they shipped, and in many cases who were entirely unacquainted with the house to whom they consigned.

"Influence of Supply on Prices" is the title of an article by Mr. A. U. Chaney, appearing elsewhere in this edition, which should be read by not only every man connected with the marketing and selling of fruits in the Northwest, but by every grower, for the reason it contains much important information and gives many valuable suggestions. Mr. Chaney is one of the big men engaged in marketing, having

GOOD BYE—RELIEF VALVE!

100, 150,
200-Gal.
Tanks

1½, 2 and
2½-H. P.
Engines



Mail us the Coupon
so we can send you
FREE BOOKLET.

The New Myers Automatic Pressure Governor Pump

not only eliminates the Relief Valve but prolongs the life of the Pump. Plungers and Valves not in action unless spray is going through nozzles.

The Myers Power Sprayer

with the Stover Engine for Power is positively the best Spraying Rig possible to build.

Light Draft and Cutaway Harrows Myers Spray Pumps



PORTLAND or SPOKANE

Here is my name for your FREE Sprayer Booklet

Name

P. O.

had many years' experience as a fruit broker and fruit dealer, and also in connection with the Cranberry Association, which business he has handled in a way that has commanded the admiration of all, having stabilized the cranberry industry and getting results for the grower that met with general approval and satisfaction. His comment upon the present system of distribution is well worthy of consideration. He calls attention to the fact that most retail dealers either visit the auction market or jobbers as frequently as they consider necessary in purchasing their supplies. In his opinion this system is inadequate, as it only takes care of the wants without accomplishing anything in the way of creating additional demand and consumption. Such a system is similar to the old system of a jobbing concern in mercantile lines many years ago when the retail dealers occasionally visited the jobber or manufacturer for the purpose of purchasing his supplies. This system of doing business has been replaced in the mercantile lines by salesmen who call on the trade at regular intervals. Mr. Chaney is of the opinion that every fruit jobber should have a sufficient number of salesmen to visit all of the retailers and dealers for the purpose of taking their orders, and at the same time telling the retailer what he has that is new in the way of fruits and what he has on the way. It seems that such a system would certainly be effective in increas-

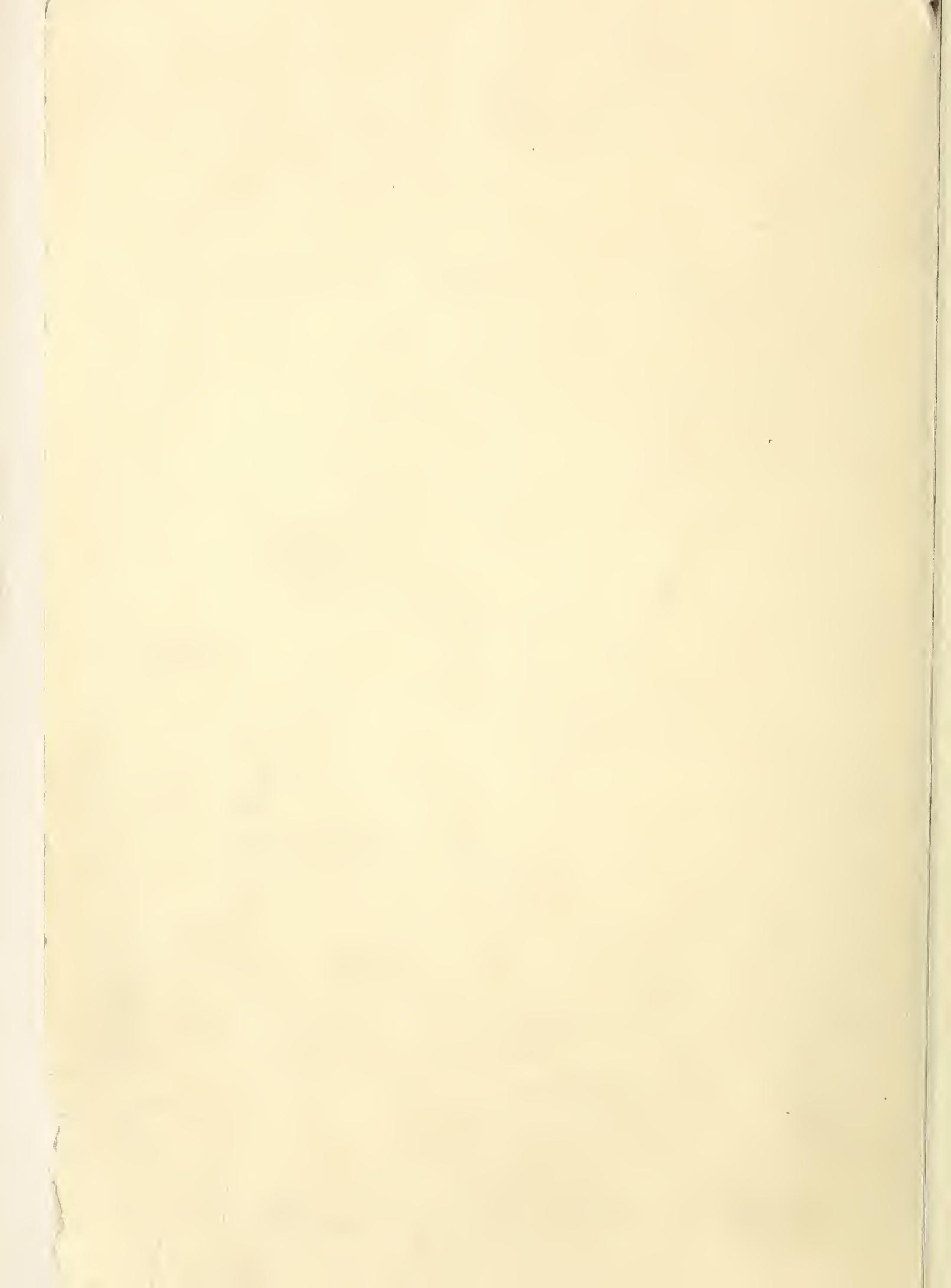
ing sales and developing consumption in the fruit business, for the reason this system has been successful in all other mercantile lines. Mr. Chaney even goes further than this, believing that every retailer should have a sufficient number of salesmen to call on the consumer regularly, believing that by such combined effort the consumption of fruit could be immensely increased. It is impossible in a short editorial to bring out the valuable points and information, and it hardly seems necessary to treat the matter further editorially than to advise everyone connected with the fruit industry to read Mr. Chaney's able article.

December First Holdings.—The holdings for apples created some little surprise, but no great disturbance. While the amount on cold storage the first of December exceeded the amount on storage on the first of December, 1914, the information was taken quite philosophically, because everyone connected with the apple business realized trade this year is about 100 per cent better than it was last year. The general consensus of opinion on the part of handlers and consumers being that it is important to keep the apples going into consumption regularly every day, every week and every month until the present supply is exhausted before the season is over. This, of course, can only be done by making the prices sufficiently satisfactory to attract buyers and create consumption. Without

question the present holdings will go into consumption regularly, and it is believed and hoped that everyone will be able to sell at a price paying a fair profit, which is much better than holding the price so high that consumption will be arrested and a large quantity remain on cold storage late in the season, which always results in a heavy loss.

The Northwest Fruit Growers' Council.—Mr. W. H. Paulhamus, chairman, has just issued a very interesting circular informing the fruitgrowers that further action on the part of the Growers' Council has been deferred until the government officials, Messrs. Bassett, Moomaw and Kerr, render a statement giving the result of their investigation which they have been carrying on in reference to the fruit industry of the Northwest, which probably will be made public in the near future. Inasmuch as these gentlemen have already formulated a plan for the benefit of the fruitgrowers of the Northwest, which they will submit to the Federal Commission and the Office of Markets for approval. If it meets with approval, then these gentlemen will come back to the Pacific Northwest and acquaint all of us fruitgrowers fully with the plan and endeavor to help us in every way possible. The editor of "Better Fruit" had a long conference with Mr. Moomaw, therefore he feels justified in saying that he believes these

Continued on page 26



We Now Present a
Marvel Motor in the

Hudson Super-Six

Patented by Hudson
December 28, 1915
Patent No. 1165861

Officially Breaking All Stock Car Records up to 100 Miles. Also All Stock Car Records for Quick Acceleration—Under A.A.A. Supervision

100 miles in 80 minutes, 21.4 seconds, averaging 74.67 miles per hour, with driver and passenger.

The previous best record of 72.49 was made by a car with more cylinders, more cylinder capacity and driver only.

73.69 miles in one hour with driver and passenger.

During this trial speed laps were made at 76.75 miles per hour.

70.74 miles in one hour, carrying 5 passengers, with top and windshield up.

The previous best record for stock car similarly equipped was made by a car with more cylinders, more cylinder capacity, and with only two passengers.

From standing start to 50 miles an hour in 16.2 seconds. This 7-passenger stock touring car was driven 1350 miles at speed exceeding 70 miles an hour without discoverable wear on any part.

All the above Hudson records were made with the same stock car, using the same motor, at Sheepshead Bay Speedway in November, under American Automobile Association supervision.

The most powerful motor per cubic inch displacement which the world has known.

Mark what these achievements mean.

No other stock car, in all the world's records, has done what this car has done.

This is not a mere new model with minor refinements, but an epoch-making car.

Even the rumor has for months kept Motordom on edge. But the wildest rumor was tame compared with truth. The Super-Six begins a revolution.

Note first that this change comes at the zenith of our success.

Only last fall a new-model Hudson won a new empire for us. It doubled our sales, and made a new record for fine cars.

We stopped that model in the height of demand, losing thousands of sales. We spent \$1,500,000 to again double production. We committed ourselves, on materials, etc., for \$42,000,000 worth of new-type cars. All because of what we now announce.

A GREATER HUDSON

On June 28, 1915, we applied for patent on the Super-Six. It was issued on December 28.

The claims we made were startling. They meant an almost twice-better Hudson. They meant reduced vibration in seemingly impossible degree.

They meant an increase of 50 per cent in possible motor speed. They meant an addition of 80 per cent to our power, without added size or cylinders.

They would give a new meaning to flexibility, silence and ease of control. It was clear that such a motor was bound to supersede the best types in existence.

CLAIMS PROVED TRUE

Those claims were based on shop tests. Now, after months of road tests, we pronounce them true.

We compared the Super-Six with our old Six, with results told on next page.

We built and bought Eights to compare with it. Then we built and bought V-type Twelves. We were, by the way, among the first to test out these types in cars.

We convinced ourselves in a hundred ways that this new motor would dominate the field. Then we abandoned forever the old-type Six, and all idea of an Eight or Twelve.

ALSO A SUPER-CAR

In the months between every detail of the car has been raised to this motor standard.

We designed a new body with larger room and with perfect flowing lines. We built it with a double cowl—in two compartments, each with a rounded dash. The finest grain leather is employed in the upholstery. The new windshield is slanted. There are disappearing seats in the tonneau.

We called in famous coach builders, experts and artists. And we gave them free hand to reach luxury's limit in the bodies for the Super-Six.

You will see that they did it. There's no need to argue that. A single glance at this new car will impress its superb distinction.

Hudson Power Increased 80%

To 76 Horsepower—Without Added Size or Cylinders

Three years ago, when Hudson engineers brought out the Light Six, it was welcomed as the ideal car.

A smaller bore and longer stroke lightened engine parts immensely. That lightness reduced vibration. The engine was a marvel for high speed, economy, flexibility and power.

That motor very quickly drove heavy sixes out. It became the pattern type. In two years it multiplied Hudson prestige and quadrupled Hudson production.

BETTERED 80 PER CENT

Let us compare that Hudson Six-40 with the present Super-Six.

That motor speed capacity is now increased 50 per cent.

The Six-40, at high speed, delivered 42 horsepower. **The Super-Six delivers 76 horsepower.**

Yet both engines are Sixes. The cylinder size is identical. No extra cylinders, size or complications. That increase in horsepower of 80 per cent shows the saving in vibration.

The Six-40 has made 55 miles per hour. The Super-Six covered 100 miles at an average speed of 74.67 miles per hour—a 7-passenger stock car, under American Automobile Association supervision. That breaks every record on stock cars, with engines of any type. It also has broken all official records in quick acceleration.

The Hudson Super-Six

\$1375



Hudson Super-Six with 7-Passenger Phaeton Body—\$1375 f.o.b. Detroit. Also Built as a Roadster, a Cabriolet, a Touring Sedan, a Limousine and a Town Car.

Mark those comparisons. And remember that the Hudson Six-40 was the leading high-grade Six.

THE MEANING OF SPEED

A motor car engine is measured by its possible high speed. That signifies lack of vibration. And swift revolution is the only way to high power combined with lightness and flexibility.

High speed in a motor means vast reserve power. It means ability to creep on high gear, to pick up quickly, to mount hills without effort, to avoid changing gears, to pull readily out of difficult spots.

All that pertains to luxury of motion depends on a high-speed vibrationless motor. That is what is accomplished in the Super-Six in a degree heretofore unknown.

A block's ride in this car will prove it. Severe tests will lead you to marvel. Comparison with any car of any type will wipe out any question of this new car's supremacy. It is too vast to dispute.

MORE FINE CARS NOW

This Super-Six will appeal to fine-car buyers. We believe, too, it will multiply their numbers.

The price, despite this luxury, is but \$1,375. That's because we shall build this season 42 million dollars' worth.

Many a man who thinks of \$1,000 will pay the difference for the Super-Six. And he will save it in engine wear and fuel.

The Super-Six is resistless. Its distinction, its beauty, its feel, its power, speed and flexibility will delight every motor car lover. The man who gets it will have all that any man can get.

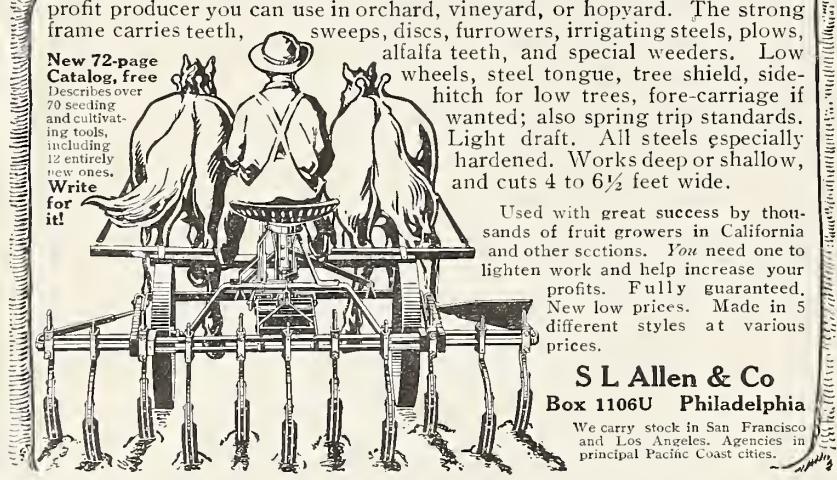
Hudson Dealers Have It Now on Show
Ask for the Super-Six Catalog—Just Out
HUDSON MOTOR CAR COMPANY
Detroit, Mich.

Planet Jr. Orchard Cultivator

—the fruit grower's greatest ally

A giant for strength! A steam-engine for work! A miser for economy! This **No. 41 Planet Jr Orchard Cultivator** is the biggest crop and profit producer you can use in orchard, vineyard, or hopyard. The strong frame carries teeth, sweeps, discs, furrowers, irrigating steels, plows, alfalfa teeth, and special weeders. Low wheels, steel tongue, tree shield, side-hitch for low trees, fore-carriage if wanted; also spring trip standards. Light draft. All steels especially hardened. Works deep or shallow, and cuts 4 to 6½ feet wide.

New 72-page Catalog, free. Describes over 70 seeding and cultivating tools, including 12 entirely new ones. Write for it!



Used with great success by thousands of fruit growers in California and other sections. You need one to lighten work and help increase your profits. Fully guaranteed. New low prices. Made in 5 different styles at various prices.

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Box 1106U Philadelphia
We carry stock in San Francisco and Los Angeles. Agencies in principal Pacific Coast cities.

Quality Fruit

comes from trees that have sufficient plant food—plant food they take from the soil—soil that is yearly replenished with the elements necessary if the trees are to have a steady growth and bear fruit in quantity and quality.

BEAVER BRAND ANIMAL FERTILIZER
“A Fertilizer for Every Soil”

puts back into the soil the plant food your fruit trees must have to make them sturdy and healthy. **Beaver Brand Animal Fertilizer** is no experiment. It is vouched for by many fruit growers who have larger and better yields from its use.

Write us today for free information folder Address Box 101



UNION MEAT COMPANY
NORTH PORTLAND OREGON.

Continued from page 23
gentlemen have accomplished a great work for the fruitgrowers of the Northwest, and it is his firm opinion they will submit a plan that will be exceedingly helpful, not only to all fruitgrowers but to all the marketing concerns, in handling the coming fruit crops of the Northwest.

Codling Moth.—The very instructive research work done by Professor T. O. Morrison, horticulturist for the State of Washington, showing the loss from codling moth to be about 30 per cent for the year 1915, which appeared in the January edition of "Better Fruit," should be read by every fruitgrower, because it is certainly very convincing evidence that freedom from worms can only be secured by proper spraying material and proper spraying methods. The loss from codling moth last year was so extensive that it ought to be evident to the fruitgrowers that thorough spraying and good materials from reliable manufacturers are absolutely necessary. While it is true the fruit-grower can occasionally omit some spray without serious loss, he cannot afford to take chance; therefore a good thing for the fruitgrower to do who wants a clean crop is to get recommendation of the Experiment Station or follow his own methods if they have been tried out and proved successful over a number of years, and follow the program throughout the season.

Tying Fruit Trees.—Most fruitgrowers postpone the tying of fruit trees until late in the summer when the crop is set and the limbs bent down with the weight of fruit, when the operation is very difficult. It is very difficult to tie the limbs late in the year without knocking off more or less fruit, therefore it is the opinion of the editor, founded on experience, that the interior framework of the tree should be tied during the latter part of the winter and spring, before the blossoming period, for the reason that the work can then be done without knocking off the fruit and much more easily than it can be done later in the year when the tree is dense with foliage. Such an initial tying of the framework seems advisable this time of year. Later in the year the fruitgrower could tie up the smaller branches and exterior branches in such a way as may be necessary on account of the crop being heavy.

Lack of Spray Materials.—Many handlers of sprays, associations, selling concerns and mercantile houses, owing to the business depression and tightness of money, bought too conservatively last year, not laying in a sufficient quantity of many of the necessary spray materials for the different diseases and pests, consequently a great many fruitgrowers were unable to obtain just what they wanted in the way of spray material and either were compelled to go without spraying or use a substitute.

The Alpha Automatic Power Spray Outfit

(PATENTED)

Fitted with 2-inch or 2½-inch Automatic Duplex or Triplex Pump.—Equipped with the New Mechanical

Automatic Pressure Governor

Which Insures Safety, Secures Uniform Pressure and Eliminates Unnecessary Wear.—No Relief or Diaphragm Valve Required.—Top Guard Rails Fold Up or Can Be Quickly Removed.—Gear or Belt Driven.—Brass Fitted Throughout.

THE TWO ESSENTIALS in a power sprayer are a thoroughly dependable engine of ample horsepower and a positive and reliable pressure regulator that will insure uniform pressure and eliminate unnecessary wear.

THE AVERAGE SPRAY RIG is equipped with a cheap engine and a makeshift pressure relief valve or diaphragm, which is exposed to the corrosive action of the spray material, which soon puts it out of commission.

THE ALPHA AUTOMATIC PRESSURE GOVERNOR with which the Alpha Spray Outfit is equipped is a simple arrangement of a combined lever and spring on each plunger connecting rod which, when the pressure reaches a pre-determined limit, automatically discontinues the operation of the pump without interrupting the driving power, again permitting it to resume operation when the pressure falls below the point at which it has been set.

THIS INSURES SAFETY, secures uniform pressure, and eliminates unnecessary wear (no liquid pumped except it passes through the nozzles), the pressure relief is not dependent on the operation of a sluggish or defective relief valve, but is positive and mechanical, thus making it impossible to run the pressure up to the danger point.

THE POWER PLANT, depending on the size rig, is either a 2½-h.p. or a 3½-h.p. Alpha Engine, equipped with a "built-in" gear-driven, positively-timed magneto, requiring no batteries or coil, and is easily started on the magneto without cranking.



CAN YOU AFFORD to own a spray outfit that will balk? When you get ready to spray you have no time to tinker with a defective engine, pump or relief valve, but want an outfit that is capable of a continued high pressure maintenance and one that is thoroughly dependable in every particular.

THE ALPHA AUTOMATIC SPRAY OUTFIT will meet your most exacting demands. The entire framework is made of channel and angle iron, fitted with a wrought steel bedplate on which the engine and pump are mounted, direct connected with machine-cut steel gears.

BUILT IN ALL SIZES from a 2-inch pump and a 100-gallon tank to a 2½x3-inch pump and a 200-gallon tank. (Either duplex or triplex.)

IT WILL PAY YOU to investigate thoroughly the merits of the Alpha Automatic Power Sprayer before buying. Send for catalog and prices.

DE LAVAL DAIRY SUPPLY CO.,
1016 Western Avenue, Seattle, Wash.

Please mail your Catalog C-2 describing your Alpha Sprayer Outfit to—

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De Laval Dairy Supply Co.

SAN FRANCISCO

SEATTLE

Everything for the Dairy

"Fruit Marketing of the Pacific Northwest" is the title of an article by Mr. H. F. Davidson, which is well worthy of the attention of everyone connected with the fruit industry, for the reason Mr. Davidson has been engaged as a fruitgrower and as a marketer of fruits in the Northwest for about thirty years, probably having had a larger and more general experience in the marketing of fruits than any other man in the Northwestern territory. In this article Mr. Davidson brings out very effectively the value of co-operation and orderly control as essential in the marketing if the fruit of the Northwest is to be marketed to the best advantage. Mr. Davidson recognizes the fact that there are many marketing concerns in the Northwest in the different districts that have been engaged in the business for years which for various reasons, as shown in his article, have controlled a large tonnage in their respective districts, and further expresses the opinion that these same concerns will continue to control a large volume of tonnage in the different districts of the Northwest. Therefore, if the fruit of the Northwest is to be marketed at a figure that will pay the grower a satisfactory profit on the investment, it is Mr. Davidson's conclusion that these marketing concerns must get together and work out a practical plan not only for the mutual protection of themselves, but a plan that will pay the fruitgrower at the same time a satisfactory profit. Without a

satisfactory profit the fruitgrowers of the Northwest cannot continue to exist, and if they go out of business there will be no business for the marketing concerns. Mr. Davidson believes it can be done. He also believes that every business man and every bank of the Northwest whose business in any way depends upon the fruit industry should assist in this work in every way possible.

Fire Blight.—It will not be long before fire blight will begin its work, therefore it seems timely to suggest to the fruitgrowers, at least to those who are not posted, that they take advantage of the present time when they are not busy to learn and ascertain the proper methods for control in order to fight fire blight when it begins to show up, because only by drastic work can fire blight either be controlled or eliminated.

The Southern Pacific Railway is doing some very valuable work in a way that certainly will be very effective in inducing travel to the Northwest with a view to assisting in upbuilding the Northwest. The Southern Pacific Railway is sending to passenger agents of the various roads throughout the United States very interesting and instructive letters about the scenery along the Overland Routes from Chicago to the Pacific Northwest, and also along the line of the Southern Pacific from Portland to San Francisco. Such information will enable the ticket agent to intelligently set forth the attractions of the Northwest in such manner as to induce many people to visit the Northwest. In connection with this work Mr. John M. Scott, General Passenger Agent of the Southern Pacific Railway, states that the Southern Pacific has issued

some very attractive folders describing the cities, towns and points of interest on the Southern Pacific line from Portland to New Orleans and from San Francisco to Ogden. They are called the "Wayside Notes Shasta Route," the "Wayside Notes Sunset Route," and "Wayside Notes Ogden Route." These booklets can be obtained by request from one of the passenger agents of this road. They are beautifully illustrated and will no doubt be good features in showing up the scenery along the Overland Routes, particularly the Pacific Coast.

Cold Weather Freezes Apples.—The very cold spell covering the entire Northwest when nearly every fruit section went to zero, and some sections considerably lower, caught a large quantity of apples on common storage, causing a very heavy loss.

Frost Damage Prevented

BOLTON ORCHARD HEATERS

29c each

Two-Gallon Capacity

Send for booklet

The Frost Prevention Co.

Merchants National Bank Bldg.

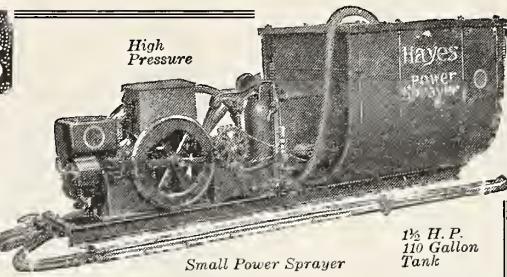
San Francisco, Cal.

Hayes Hand & Power SPRAYERS

HIGH-PRESSURE Spraying is plus spraying—it is 100% efficient. High Pressure completely atomizes the solution into a penetrating, fog-like mist that *seeks out and adheres* to every particle of foliage. It reaches protected pests that lurk in the innermost crevices of the bark, under bud scales and beneath the stamens of apple blossoms, and easily controls those on the outside surface. Mere "sprinkling" at low pressure will not give practical control.

Not only does High-Pressure Spraying insure a better quality of fruit but requires less solution, less time to apply, hence lessened cost. A High-Pressure Power Sprayer will pay you bigger dividends than any other orchard investment you can make.

HAYES Power Sprayers are tested to 500 lbs. and are *guaranteed* to develop 300 lbs. working pressure. They are built for con-



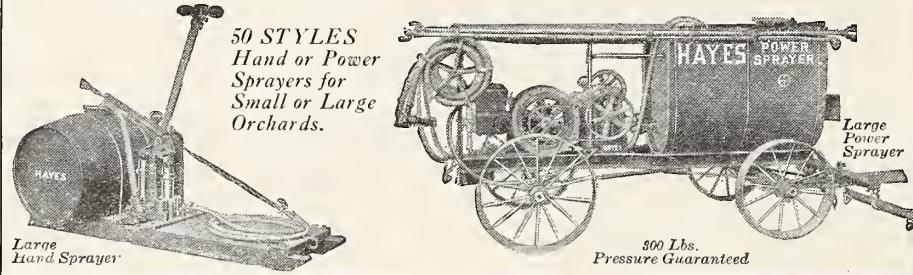
Small Power Sprayer
110 Gallon Tank

stant operation at high pressure and enduring service. This not only requires the most thorough mechanical construction but the highest grade materials, hose and fittings.

50 STYLES Large and small Hand and Power Sprayers for orchards, field crops, shade trees, hops, poultry, disinfecting, painting, farm, home and garden use. Complete outfits or separate spray pumps, hose, nozzles, fittings, bamboo rods, etc.

WRITE! Send postal for FREE BOOK 32 on High-Pressure Spraying and 64-page Catalog.

HAYES PUMP & PLANTER CO., GALVA, ILLINOIS



Fruit Marketing of the Pacific Northwest

By H. F. Davidson, Hood River, Oregon.

MARKETING the 1915 Northwestern boxed apple crop is largely a matter of history. Prices have not been good, and growers will have been good and growers will have money of their own as profits to put in the banks to their credit. The crop has been sold down to practically two varieties, Newtown Pippins and Winesaps, both late-keeping spring apples, and at least fifty per cent of these two varieties have been disposed of. When the Northwestern growers receive a fair price for their apples, on a fair yield, they make money, and the 1915 crop is bringing them a nice profit for the Extra Fancy and Fancy grades.

In each of the large fruit-growing districts of the four Northwestern States—Oregon, Washington, Idaho and Montana—many substantial local marketing firms have grown up with the orchards and have interwoven their affairs with those of the communities in which they operate by establishing personal friendships and confidence, and by using their financial credit to assist growers who are not financially able to grow and harvest their crops unaided; which in some cases is more or less of a continuous proposition from year to year, and in this way these packing and shipping concerns have established themselves and kept themselves established in their re-

spective localities to the extent of controlling the marketing of a large percentage of the fruit crop of these four states.

Theoretically, the big marketing organizations which have been formed to handle the large tonnage are about ideal, but to a large extent these big organizations have been handled and managed by men who did not have the confidence and support of the local shippers, with the result that no organization up to the present time has been able to control a sufficient percentage of the tonnage to maintain sufficient control over the distribution whereby it could obtain what appeared to the growers to be maximum results. The men who are managing these big marketing organizations are men of the very highest type; have the confidence of the growers and bankers generally, but they have the competition of the local shippers whose personal acquaintance and knowledge of local conditions, added to their ability to extend credit to local growers, has divided the control of the tonnage to the extent that the large organizations have not enjoyed the opportunity to test the theory of centralized distribution and selling with proper control of the tonnage.

It was demonstrated in 1913 that on a short crop year, when the demand ex-

ceeded the supply at highly remunerative prices to the grower, that a large organization with only a fifty per cent control could distribute and market that part of the tonnage in a manner that materially strengthened the marketing situation, and for the first time in the history of the Northwestern fruit industry, since it assumed any considerable volume, prices actually advanced and the advances were maintained during the heavy part of the marketing season.

It was just as clearly demonstrated in 1914, with considerably larger crops and with markets curtailed by depressed financial conditions and the European war, and when there was really a surplus above the actual demand at profitable prices to the growers, that the organizations could not maintain any substantial influence in the markets with but fifty per cent of the tonnage under control.

It is freely admitted in the Northwest that there are orchards enough now growing to produce a big surplus of fruit above what can be marketed at a profit to the growers. Under the hap-hazard hit-and-miss conditions which must of necessity exist when a number of small shippers are working independently of each other in each of the producing districts and it must be determined within a short time whether the future crops will be marketed in a systematic way or whether the deal will be along the "starve-out" route and the survival of the fittest result in the elimination of too big a percentage of orchardists and present fruit acreage. At the moment, Hood River is the only district which has practically no competition within its own district. This district has an organization which is marketing a very large percentage of its product, and the result of this season's operations will enable the growers of that district to determine whether or not this plan is successful. The Hood River crop this season happens to be largely of export varieties, which is a serious handicap under the strenuous European war conditions, but good headway is being made by personal representation in Europe and that portion of the crop suitable for domestic markets is well nigh marketed, with extremely satisfactory results.

The fruitgrowers of the Northwest find it difficult to get together on any practical and efficient lines. When a grower located in Hood River he did so because he knew it was the best fruit district in the world, and was soon taught that all the other districts might be forced out of business while the natural advantages of his district in producing big yields of fruit of so much finer quality that any of the other districts could produce would enable him to make a profit when the growers in the other districts were forced to make losses and discontinue the business. This same line of argument has applied to the growers who located in each of the big districts and has not left the growers of Southern Oregon, for instance, in a frame of

mind to feel the necessity or propriety of co-operating seriously with the growers of Wenatchee or Southern Idaho, and this same thought applies to many growers in all of the prominent sections.

Experience shows that there is another class of gentlemen, who are fewer in number, most of whom see the handwriting on the wall, and it appears to be up to these gentlemen, the shippers, to work out a practical plan for the mutual protection of themselves and the growers that will preserve the fruit industry of the Northwest on a basis that will be profitable to the growers as well as themselves. To the shippers must be added the influence and advice of another class of gentlemen in the Northwest who are becoming vitally interested in the proposition, and who will become more interested if the unpaid notes become musty, and they are the bankers, the gentlemen who must finance the growing and harvesting of the crops if enough revenue is to be produced to enable the note makers—the growers—to pay up.

The question before the house is, Will enough men out of the large number of practical shippers and practical bankers get together and give this matter sufficient attention to work out the proper solution. The proposition is not seriously complicated from this angle, but it will require an honest, energetic, intelligent effort on the part of a number of loyal gentlemen to solve the problem. The intelligence is easily available. Enough experimenting has been done and enough experience has been gained to reduce the task largely to that of energy and effort to bring the fruit industry of the Northwest from a condition of chaotic disappointment to one of satisfaction and profit to growers, shippers and bankers and merchants. The industry is estimated to represent an investment of over \$200,000,000, and while a very large percentage of this investment has not reached the full-bearing age, yet it should produce an income of from \$15,000,000 to \$20,000,000 in 1916 and should show a gradual increase from year to year.

A Good Word for Apple Diet.—Mrs. J. H. Kline wrote a short article, which appeared in the San Francisco Chronicle, stating that she is the matron of a boys' home and has found by experience and observation that the kinds of food that the boys eat are serious factors in their dispositions. The most interesting observation to the fruitgrower in connection with her studies is that she notices that a liberal supply of apples mixed with their diet acts wonderfully for their betterment, observing also that chemists have never been able to produce anything that acts so well on the liver as apple juice, not the pressed-out juice or cider, but the juice chewed out of an apple by the teeth; and what is equally important in the way of increasing consumption is her statement "that no boy ever refuses an apple."

British Columbia Apples for San Diego Exposition.—The San Diego Exposition is to be continued for another year. It is interesting in connection with this statement to know that the Department of Agriculture of the Dominion Government, Ottawa, in appreciation of the value of this splendid opportunity for publicity, have instructed the Province of British Columbia to prepare and ship 1,000 boxes for exhibition.

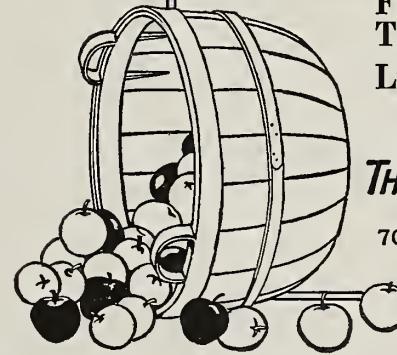
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Apple Exports.—Up to about the first of January the apple exports have been light compared with last year, the quantity already exported only being about one-half of what was exported up to the same time in the year 1914. The falling off of the export trade is due principally to the fact that it is difficult to obtain space on freight steamers, and also to the fact that the rates are so exceedingly high.

the Office of Markets and Rural Organization, United States Department of Agriculture, on "Cold Storage," there was on cold storage December 1, 1915, 4,206,825 barrels of apples, showing an increase over last year. Figures for December 1, 1914, were 3,234,829 barrels. The situation is reversed in the box business, 1915 showing 3,375,997 boxes, against 4,147,506 boxes December 1, 1914, a reduction of 771,509 boxes.

Oregon Hens.—The final reports of the official records made by the Oregon Agricultural Club hens at the Panama Exposition show that while the White Leghorns won by a handsome margin over all competitors, the other two college pens, the Oregon and Barred

Rocks, tied for second place over all other competitors. The pen of Leghorns laid 1,616 eggs during the year; the other two pens referred to 1,407 eggs each.

The Consolidating of Two Fruit Districts.—Underwood and White Salmon districts are working to combine the two existing organizations under one head, which seems a step in the right direction, as the kind and quality of fruit produced in both districts are the same.

White Salmon Apples Win First Prizes in New York.—The State College of Agriculture, according to the White Salmon Enterprise, White Salmon was awarded first prizes on the following varieties: Hydes King, Ortley, Winter Banana and Gravenstein.

Death of Mr. W. B. Glafke.—All fruitgrowers will learn with much regret of the death of W. B. Glafke, who has long been identified with the fruit industry as one of the leading commission merchants of Portland, where he was in business for the past thirty years. Mr. Glafke was one of the best-liked men on the street, and known for his kind heartedness and generous way of dealing.

Lime Sulphur Lead Arsenate Bordeaux Paste Spra-Sulphur

The most serious pests and diseases doing the most damage to trees in the Northwest are San Jose Scale and Anthracnose. The ones doing the most damage to crops and causing a loss of millions annually to fruit growers, are Codling Moth and Scab.

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The History of Axle Grease

While lubricants have been used on axles ever since the first pair of wheels was carved out of wood, the axle grease of the present day is of comparatively recent manufacture. Probably the first lubricant of any kind to be used on axles was pure animal fat—quite similar in every respect to the grease the housewife of today uses in greasing her pans. This met the requirements of that day and generation—and indeed, it is still used in some parts of the world. We need go no further than Cuba, or Central America, where the big clumsy wooden-wheeled, ox-drawn carts are still in vogue. Each carreta (as they are called) carries a bottle of grease tied to the axle, so it will be handy when needed. Owing to the poor lubricating qualities of this tallow, the axles must be greased frequently. What a contrast between this and our present-day methods!

Various kinds of oils have been used for axle lubrication, but for the reasons that they were too expensive, not heavy enough, etc., they have been discarded, notably castor oil, which is now prohibitive in price. The ideal axle grease must embody these points—a good lubricant—must not contain acids that will injure the axle—must be durable—of sufficient consistency to withstand the summer heat—and in wet and stormy weather during the winter, axle grease must be sufficiently adhesive (without being gummy) so that the water will not wash it from the axles. Flake graphite added in the manufacture to Regular Amber-Colored Axle Grease makes a combination which is particularly fitted to overcome moisture, and that is why a graphite axle grease is recommended during the winter months. The labor-saving American public is willing to pay for anything that will, in the end, save them time or money. Although there are many cheap grades of axle grease on the market, the best brands, which cost a trifle more, are the only kind that have given satisfaction. Sensible purchasers throughout the world realize that quality means more than price, and that cheap greases cost more in the end. For that reason, sales of high-grade axle greases are increasing every year.

Winter Injury of Fruit Trees

The extremely cold weather of the early part of this month (January, 1916) will probably do harm to many tender fruit trees and shrubs. The most severe cases will result in killing back the young wood and splitting the trunks and large branches of the trees; the young branches turn brown or black throughout and usually wither slightly. In the larger branches and trunk the inner bark, or the cambium layer, and part of the sap wood may turn brown, the bark often splits in a perpendicular line and curls back. The wood of the trunk may split in extreme cases. The bark is sometimes killed

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entirely around the trunk at or just above the surface of the soil or snow.

In handling such injuries, Professor O. M. Morris, horticulturist of the Washington Agricultural Experiment Station at Pullman, advises that the winter-killed twigs should be cut back to sound or live wood. Sometimes the sap wood is injured and turns brown, but is not killed. If cutting away all such injured wood necessitates extremely severe pruning it should not be done. However, all wood on which the bark is killed should be pruned away. The split bark on the trunk and larger limbs should be prevented from curling back by banding or by the use of tacks and small nails. If the bark is killed back from the edge of the split an inch or more on each side this should be covered by bridge grafting.

The winter injury that is most liable to kill the tree is that form in which the trunk is girdled. This can be bridge grafted and the tree saved with only slightly checking its growth. The pruning away of injured parts should be done as soon as possible after the harm has been done. The bridge grafting should be done just before rapid growth starts in the spring. This process is described in Popular Bulletin No. 67 of the Experiment Station.—Washington State Experiment Station Bulletin.

Good Roads.—It is stated that 1,000 miles of perfect roadway have been constructed by the prisoners of the penitentiary of Colorado. This work was first done under armed guards, but later the honor system was introduced and is still in vogue. Colorado's plan was successful in securing good roads at a very low cost of production. Good roads are essential to the upbuilding of every community and are a necessity for economy in transportation for every farmer. The automobiles have done more to bring about good roads than any other industry of the United States. Automobiles have made good roads popular, and good roads in turn are making the automobile popular. Originally automobiles were principally used for pleasure, but now they are becoming a business necessity. With good roads and automobiles there will be much more traveling, and the combination presents an opportunity for sight-seeing, pleasure, health and increased business. Nothing would be more successful in bringing settlers to the Pacific Coast than a good overland automobile road between the Atlantic and Pacific Oceans. Iowa has long been celebrated for good roads, the result being a passenger automobile to every fifteen people. In Kansas many of the blacksmith shops are being converted into garages. There are over 73,000 automobiles in Kansas. New Jersey is another state where good roads have increased prosperity. Although only a small state it contains 79,300 passenger cars and 11,000 motor trucks, paying annual license fees of \$1,155,000. California, the state noted for good roads and delightful weather for traveling the year round, has 160,000 automobiles. The good-road movement in Oregon and Washington has resulted in improvement on all roads. The completion of the Columbia Highway between Portland and Hood River is the most wonderful achievement of road building in the United States in every particular. The scenery along the Columbia River, which the Columbia Highway parallels, is unequalled in any similar mileage in the United States. Those who have traveled all over the world are frank to admit that this piece of roadway has the most wonderful scenery of any roadway of similar length anywhere in the world.

The Shippers' League Defer Completing Organization.—The movement on foot to incorporate a Shippers' League has been deferred until a report shall be rendered by the government officials who have been engaged in studying marketing conditions in the Northwest. The last session was held in North Yakima in the middle of December. The following resolutions were adopted, which will be of interest to the fruitgrowers, indicating a strong desire on the part of all selling concerns to co-operate with any plan for the betterment of marketing conditions that may be suggested by the government officials now engaged in formulating a plan for the improvement of the fruit industry of the Northwest: "Whereas, the present fruit marketing situation can be met only by growers and shippers working intelligently together to bring all the tonnage under orderly control that will prevent demoralization of markets and will make possible the expansion of markets to provide an outlet for the increasing quantity of fruit; and whereas, there exists an opportunity to secure co-operation of the Federal Trade Commission and the U. S. Office of Markets in making a complete survey and recommendation on this situation; and whereas, united action of the strong shipping factors of the Northwest is necessary to secure this federal co-operation; and whereas, we believe that generally concerted action of these same shippers can greatly increase the outlet and distribution of our Northwestern fruits; therefore be it resolved by the members of the Northwest Fruit Shippers' Council: That we

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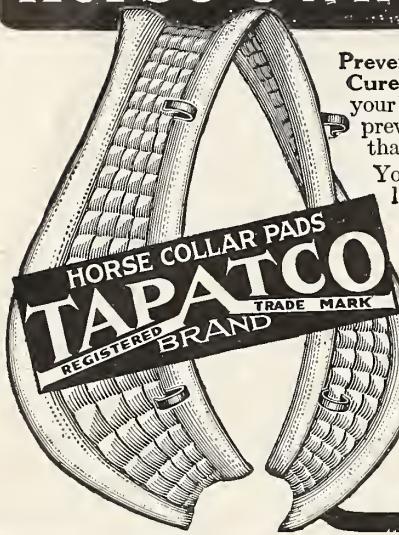
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pledge ourselves to united action and to give our united assistance in helping the work of the representatives of the government; and that we express our earnest determination to work together and to incorporate a permanent non-profit-sharing corporation to develop methods and ways and means of meeting the existing situation by working out a plan of marketing and of market extension that will enable us to sell the box-apple crop of 1916 and succeeding years at prices that will be profitable to the grower." The following interests were represented at the meeting: J. H. Robbins of Spokane, F. E. Sickels of the North Pacific Fruit Distributors; W. F. Gwin and Worrall Wilson of Seattle, the Northwestern Fruit Exchange; L. J. Blot of Spokane, the Spokane Fruit Growers' Association; Wimmer Seig of Hood River, the Hood River Apple

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Growers' Union; Conrad Rose of Wenatchee, the Wenatchee Produce Company; H. M. Gilbert, the Richey-Gilbert Company; Fred Eberle, the Horticultural Union, and Clyde McKee of the Thompson Fruit Company. The government officials are C. E. Bassett, W. H. Kerr, C. W. Moomaw and J. C. Gilbert, all from Washington, D. C., and representing the office of Markets and Rural Organization. The apple growers of the Northwest were represented at the meeting by W. H. Paulhamus, chairman of the board of trustees of the Growers' Council, and Gordon C. Corbalay of Spokane.

Big Estimates.—In these days of big estimates and scares over the immense big apple crop that the Northwest may have in 1916, it is interesting to note the observations of the Daily World, published in Wenatchee, which appear in an Eastern trade paper, briefly as follows: "When everybody in Wenatchee district was mad five or six years ago, Wenatchee was credited for the year 1915 with 12,000 cars of apples. The actual production for 1915 was 4,000 cars." The World calls attention to the fact that estimators overlooked the fact in calculating that there are many adverse conditions that interfere with the tonnage calculations on paper, mentioning a few like blight, worms, lack of water, winter kill and various other pests, and wisely comments in conclusion that the stories of enormous production always hurt the market. While it is a good thing to have the marketing agencies organized so they can take care of the maximum production, yet such stories as went the rounds of the public press have an unfavorable influence on the market. This is very much in line with the idea as expressed by the editor through the columns of "Better Fruit" frequently during many years in the

past, who again desires to call attention to the fact that in Spokane a few years ago the crop for 1915 was estimated by one of the railway officials at 50,000 cars for the Northwest, whereas the 1915 crop when harvested was approximately 10,000 cars, maybe less.

Warning to Fruitgrowers.—Mr. Luke Powell, District Horticultural Inspector, Prosser, Washington, has issued a letter of warning to the fruitgrowers. Lack of space in this issue, much to our regret, prevents publication in full, but briefly the main features of the warning are covered in the following condensed statement: "Beware of any mysterious, marvelous and secret remedies that are offered for sale for the control of any pests, diseases or troubles of the orchardist. It is quite common on the part of such manufacturers to state that the secret compounds are the result of many years of study, but that perfection has been achieved." In Mr. Powell's letter of warning to the fruitgrowers, an extract is made from Circular No. 141 of the Agricultural Experiment Station of California, which gives some very interesting information in reference to the Experiment Station examinations of various remedies that are offered for sale. Mr. Powell advises fruitgrowers not to try any unknown remedies and he presents very valuable suggestions in advising fruitgrowers, where they have troubles, diseases or pests, which they do not know how to control, to consult the United States Department of Agriculture, the Experiment Stations in their respective states and the various horticultural departments. The government man and the Experiment Station man receives his pay from the state or government. He is competent, and therefore his recommendations are always valuable and are also free from commercialism.

The Shippers' League makes the following announcement of committees:

Export Markets—W. F. Gwin of the Northwestern Fruit Exchange, J. H. Robbins of the North Pacific Fruit Distributors, Wilmer Seig of the Hood River Apple Growers' Union, Conrad Rose of the Wenatchee Produce Co. and H. M. Gilbert of the Richey & Gilbert Co. Eastern Markets—G. C. Corbalay of Spokane, W. F. Gwin, Walter Kimball of Hood River, Orris Dorman of the Spokane Fruit Growers' Association, Fred Eberle of the Yakima County Horticultural Union and George Coburn of the Wenatchee Fruit Growers' Association. Northwestern Markets—H. M. Gilbert, B. A. Perham of the North Pacific Fruit Distributors, H. G. Fletcher of the Northwestern Fruit Exchange, Conrad Rose and L. J. Blot of the Spokane Fruit Growers' Association. Home Markets, including those on the Sound and West Coast—Wilmer Seig, C. R. McKee of the Thompson Fruit Co., B. A. Perham, G. W. Coburn and W. M. Nelson of the Yakima County Horticultural Union.

Wire Fencing for the Farm and Orchard.—The Department of Agriculture in its Weekly News Letter, says in reference to farm fencing that it should combine two qualities—service and economy. To give service it must turn all kinds of stock without injury. To be economical it must be built as cheaply as is consistent with durability. In selecting a wire fence it is preferable to economize by eliminating unnecessary wire rather than by using a lighter wire. The factor which determines the price of woven-wire fencing is its weight, so that in fences of the same height a wide-spaced fence, with comparatively fewer wires, costs less than the narrow space with more wires. An important factor in selecting wire is that a man should not use any smaller mesh than is necessary to turn the kind of stock for which the fence is built.

Mr. J. H. Robbins, manager of the North Pacific Fruit Distributors, tendered his resignation to take effect immediately, which was very much of a surprise to all of his friends throughout the Northwest. Mr. Robbins came to North Yakima and was one of the original organizers of the Yakima Valley Fruit Growers' District Association, which afterward entered the North Pacific Fruit Distributors, Mr. Robbins becoming general manager of the North Pacific Fruit Distributors. During his administration he has made many warm friends, who will regret his leaving the fruit industry. It is Mr. Robbins' intention to go into private business for himself. The reasons given for his resignation are on account of poor health and a desire to engage in private business.

A Standard Box for Apples.—The bill for standardizing a box for Northwest apples, which was introduced into the last session of Congress and pigeonholed, will again be presented to Congress this year by Mr. John E. Baker of California. This bill will have the endorsement of all fruitgrowers in the Northwest, and therefore will have the support of all Senators and Congressmen of the Northwest—in fact the entire Pacific Coast. The standardizing of all kinds of packages is highly desirable and is being demanded by the consuming public. There is no question in the minds of the fruitgrowers that we ought to have a standard box for apples, and the quicker we have a law the better it will be for the whole box-apple industry.

Permanent Tariff Commission.—The Chamber of Commerce of the United States, National Headquarters, Riggs Building, Washington, D. C., has just issued a very interesting circular which is well worthy of the attention of every citizen of the United States, on the tariff problem. These can probably be secured by request to the above address. On the cover page is a statement as follows: "Referendum of Commercial Organizations, 715 Votes for 9 Votes Against." It looks very much as if chambers of commerce, who understand trade conditions, will show a unanimous opinion in favor of permanent tariff commission.

The Pacific Fruit and Produce Company.—North Yakima, Washington, according to the Exchange, have issued a circular stating they handled 1,210 cars of fruit and vegetables during the year 1915, paying the producers \$302,284.36. The Pacific Fruit and Produce Company shipped 181 cars of apples, 134 cars of peaches, 36 cars pears, 13 cars cherries, 4 cars prunes and 1 car of grapes. Their statement shows that in 1914 they shipped 14,480 boxes of apples at an average price of 61 cents per box. In 1915 they shipped 40,341 boxes at an average price of \$1.11.

Stark Bro's Nursery and Orchard Company Centennial.—One hundred years ago Judge James Hart Stark moved from Kentucky to Missouri, where he established the present nursery, the site of which was only a small part of the present plant. In Europe, where firms continue from one generation to another, such an announcement would not command much attention, but in America, where changes are made so frequently, it is something so unusual for one firm to continue one hundred years in business and be passed on from father to son for four generations that it seems worthy of some notice in the columns of "Better Fruit," and for the reason it indicates to the fruitgrower that when business is properly attended to there is a stability in the orchard business and the nursery business that most people do not realize. Stark Bro's Nursery is credited as being the oldest nursery in the United States, and so far as we know this statement is correct. The nursery is under the administration of the fourth generation, Edgar W. Stark being president; Lloyd C. Stark, his son, is vice-president. Other members of the Stark family connected with the nursery are: Thomas W. Stark, secretary; Paul C. Stark, chief landscape department; Clay H. Stark and Lawrence E. Stark, sales departments.

From a very small beginning the Stark Nursery, which illustrates the growth of the fruit industry, has grown to a very extensive proposition, with plants located at Dansville, New York; North Girard, Pennsylvania; Fayetteville, Arkansas; Marionville, Missouri; Huntsville, Alabama. At the present time the Stark Bro's Nursery is recognized as one of the largest in the United States. Stark Bro's Nursery has been very progressive and has introduced a number of new varieties of fruits, which have met with much favor, some of them having achieved a wonderful degree of success commercially by being recognized as standard commercial varieties. Among the varieties of apples introduced by Stark Bro's Nursery are King David, Black Ben, Senator and Champion. But perhaps no apple introduced in recent years has commanded quite the attention or achieved the degree of popularity as the Delicious, which is considered one of the most delicious eating apples grown, and selling at top-notch prices. Stark Bro's Nursery believe in advertising and publicity and spare no expense in introducing new varieties when they consider them worthy of introduction. It has been stated they spent one-quarter of a million dollars in introducing the Delicious and one hundred thousand in introducing Black Ben. Stark Bro's Nursery, in celebrating their centennial, one hundred years in the business, have just issued a new catalog which is called their "Centennial Fruit Book," consisting of 72 pages.

Fruit Shipments East and West Up to December 1.—According to figures compiled by A. A. Piper, local agent of the Great Northern, 2845 cars of fruit were billed from the Wenatchee station during the 1915 shipping season to December 1. This includes all fruit, cherries, peaches, cots, pears and apples of all grades. Of this number 2,189 were loaded at Wenatchee, the rest loaded at nearby stations and billed from here. The following table, giving Eastern and Western routings, is interesting in that it shows the percentage of the crop that moves east and west. Approximately 25 per cent of the tonnage is routed west, either for storage or for consumption on the Coast market, including Seattle, Vancouver and San Francisco, and for the Australian market. The carlot shipments are:

	East	West	Total
Wenatchee	1704	485	2198
Malaga	124	13	137
Monitor	37	4	41
Appledale	7	1	8
Palisades	20	37	57
Ohio Colony Spur.	10	3	13
Malott	2	..	2
Winesap	13	1	14
Zena	3	..	3
Wagnersburg	43	10	53
Olds	286	42	328
Total	2249	596	2845

The foregoing does not represent total shipments from Monitor, as during October and November all cars were billed from that station.—Wenatchee World.

The Yuba Bulletin is the name of a quarterly publication issued by the Yuba Construction Company of Marysville, California, and contains much interesting information in reference to the efficiency and economy of tractors in connection with cultivation in the orchard and farm.

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trol of apple scab and at the same time has been watching the work done by practical growers in this direction. From the results of these investigations and observations, the conclusion is forced upon us that, no matter how bad the year may be for this disease, the intelligent application of our present knowledge will result in satisfactory control.

So much has been written and said on the subject of Apple Scab that there is no need of describing the disease in detail. You understand that the parasitic fungus which causes it lives through the winter in the dead tissues of the fallen apple leaves, and that in the early spring a crop of spores is matured which are shot forcibly out of these old leaves and then, caught by the lightest air currents, are carried to the newly-developing foliage and fruit, causing on them the first scab infections of the season. It was for a long time thought that this crop of spores did not mature until about the time the blossoms open and that infections could not occur earlier. In Oregon, however, we have found that at least in some seasons these spores may be mature approximately a month before the blossoms open. Under such circumstances, if the weather conditions are favorable, infections may occur before the cluster buds are fully opened, often a considerable time previous to blossoming. These first in-

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Apple-Scab Control in Oregon

By H. P. Barss, Professor of Botany and Plant Pathology, Oregon Agricultural College, Corvallis.

REPORTS from different parts of Oregon during the past season indicate that Apple Scab has been unusually severe in many sections. The loss due to this disease alone will probably amount this year in rough estimate to over \$300,000 in this state. In many an unsprayed orchard there could not be found a single scab-free fruit this year, and even in orchards where the owners did spray, there was

often a seriously high percentage of scab, sufficient in some cases to remove all trace of profit from the ledger. The question arises as to whether these conditions must continue to exist. Is it really necessary for every particularly bad year to take this terrific toll from the Oregon orchardist? I am confident that there is no need of it. For several years the College has been conducting investigations on the econ-

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fections will develop into typical scab spots on the young leaves and flower parts and in a week or two there will be a new crop of spores produced in these spots which, as you are aware, usually result in an exceedingly rapid spread of the disease in the orchard, attacking fruit and foliage alike.

There is now no longer any doubt regarding the natural conditions which make possible the spread of the disease. Moisture is absolutely necessary for the germination of the spores and those climatic conditions which enable the dew, rain or fog to remain upon the leaves or fruit for a considerable number of hours in succession, make it possible, where spores are present, for those spores to sprout and send their delicate germ tubes through the cuticle, after which the infections will take care of themselves. Anything that promotes rapid drying of foliage tends to prevent infection. Wind and sunshine, even though interspersed with showers, are unfavorable to the disease, while cloudy or misty weather with little wind, even though there be practically no rain, makes possible abundant spore germination.

Years ago, before the nature of this disease was yet fully understood, an effort was made to find some means by which it might be prevented. Bordeaux mixture had been found of such value in connection with certain other plant diseases that it was naturally one of the first materials tried out as a spray for the control of this malady. As long as twenty or twenty-five years ago in the eastern part of this country bordeaux was shown to be decidedly beneficial, and the large number of tests carried out since that time all over the United States leave no doubt as to its efficacy for scab control in the mind of any one familiar with the results. There was, however, one drawback in connection with bordeaux mixture wherever used, namely, the tendency under certain conditions to cause russetting of the apple fruit. It was thought at first that the mixture was being used too strong, but experiments demonstrated the fact that injury would occur when weak dilutions were used, and it was found that this could not be prevented by any change in the proportions of the ingredients. It was found that this injurious effect was present only on fruit sprayed when young, and it is now further understood that moist weather following the application of bordeaux mixture provides the most favorable conditions for the appearance of russetting.

With the introduction of lime-sulphur as a fungicide, experiments were begun throughout the country to test its usefulness as compared with bordeaux mixture for the prevention of apple scab. It was a great satisfaction to find that this new spray material was really effective for this purpose and that it did not produce on the fruit the objectional russetting caused by the other. Lime-sulphur has consequently superseded bordeaux throughout most of the apple-growing sections



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BETTER FRUIT

of the country for scab control. Lime-sulphur, however, is not perfect in all respects, for in the higher strengths it will cause burning of apple foliage, and even in the lower dilutions, particularly with drenching, it may result in injury to foliage, although this is not usually of great importance. Under certain conditions, however, the injury may be quite severe, and in addition to scorch on the leaves there is also a serious tendency to cause sunburn on the fruit in hot weather. Complaints of the trouble just referred to come, I believe, largely from sections subject to at least occasional spells of very high temperature.

Other fungicides are now being tried out experimentally over the country and new combinations of fungicides as well, in an attempt to find a suitable spraying program which will give the desired control of scab and avoid at the same time the injuries which have been mentioned. The Agricultural College has been making tests for the past two years under the direction of Mr. Winston at the Hood River Branch Experiment Station and some interesting facts bearing upon the problems of scab control have been brought to light. Some additional investigations in which the writer was assisted by the horticultural inspectors of the state have laid bare many of the reasons for lack of success in scab control, and have pointed out the way to remedy some of the difficulties.

In connection with the work on apple scab in the Hood River Valley it was found that the period of most abundant scab infection in 1913 occurred in the latter part of June. In the following year, on the other hand, the most serious infection occurred previous to the time the flower buds showed color. Furthermore, during the season of 1915, the most disastrous infection occurred as a result of a long rainy period, commencing perhaps two weeks after the petals began to fall. Each year there were a great many growers whose apple crop suffered badly, but at the same time each year there were some whose apples were practically clean. Investigation showed that the men who had clean fruit were those who had made an application of fungicide not long before the critical period. This is illustrated also in one locality in Southern Oregon, where during the past season there was a spell of wet weather favorable to scab four or five weeks after the bloom fell. In an orchard where the owner gave the usual four applications there was but 5 per cent of scabby fruit. Another grower in the same district gave three sprayings, with excellent control as far as he went, but omitted the fourth application. After the rainy period referred to, 70 per cent of his fruit developed scab spots.

It is evident, from these examples, that in Oregon there is such variability in weather conditions through the spring, that in order to be certain of a clean crop the grower must protect his trees by a suitable fungicide

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hroughout the entire season from the time the buds begin to open until all danger of scab-favoring weather is past, or else he must acquire more skill as a weather prophet than most of us ever hope for. In addition to the poor results which have come from failure on the part of the growers to keep their trees protected at all times during the dangerous period, we must mention the poor results that are attributable to lack of thoroughness. There are abundant instances in our apple-growing sections where two neighbors using practically the same spraying schedule will have entirely different results as far as scab control is concerned simply because one has always done the work thoroughly while the other has not. Too great emphasis cannot be laid on thoroughness. Growers must understand clearly that any portion of the surface of a fruit or leaf not covered with spray mixture naturally remains unprotected against infection. A spore can germinate and penetrate fruit or foliage at any point where no fungicide has been deposited.

I wish to call attention to the desirability of destroying or plowing under the fallen leaves. Wherever this has been thoroughly done there seems to have resulted a marked diminution in the primary spring infections. I doubt whether it is possible to do so thorough a job, however, that spring spraying could safely be abandoned; but present evidence indicates that it is a desirable practice which ought to be encouraged. It may perhaps be possible to destroy the fungus in the fallen leaves by some spray applied to them after they have fallen, but experiments with the standard fungicides have given negative results. These, however, form a practically insoluble coating on the exterior of the leaves and would not be likely to have any effect on the fungus which in this stage lies protected within the leaf tissues. My attention, however, has been called to an orchard in the Willamette Valley badly affected with scab last year where the owner sprayed part of it this spring just as the buds were swelling with pure bluestone (copper sulphate) at the rate of 2 pounds to 50 gallons of water, while part was left unsprayed. No further fungicidal application was given. It is reported that on the sprayed section

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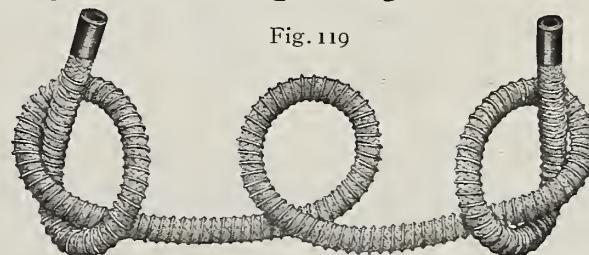
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Fig. 119



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85 per cent of the fruit was free from scab, while the unsprayed part yielded 75 per cent of scabby fruit. The only explanation I have to suggest is that the application of copper sulphate reached the ground covered with old leaves and, penetrating these, killed the fungus, thus preventing spore production from them and the consequent early infections. I give this to you for what it is worth, since the case did not come under my direct observation and the method has, as far as I know, never been tried out experimentally. I believe it worth further investigation, however.

Regarding the use of different fungicides, our experiments in the Hood River Valley have shown that various results may be expected, according to time of application and the conditions to which the trees are subjected. We have found that bordeaux and lime-sulphur cannot be surpassed as fungicides, but injury may be expected under certain conditions to which I have already referred. Atomic sulphur is not likely to cause much injury when its use is begun while the foliage is young, but in cool weather it seems to be much less efficient as a fungicide than the standard materials, while if the first application is made late in the spring, according to some growers, a considerable leaf-dropping may follow. A new preparation tried out for only one season, Barium-Sulphur, seemed to give a fairly satisfactory scab control with the least injury of any substance tried. Further tests, however, should be made before any general adoption of this material can be advised.

It is evident from the foregoing that the intelligent grower must base his spraying methods upon a knowledge of the disease, and the factors that influence it, together with an understanding of the materials that may be employed for fungicides and the conditions under which they may be safely used. There is absolutely no question but that apple scab can be successfully controlled anywhere in Oregon if the fruit and foliage are properly protected. Spray injury may not always be avoided, but much of it can be prevented by a wise selection of the material to be used at any particular stage.

Present Recommendations.—We have found that in our scab control experiments lime-sulphur gave better results with less injury than any other fungicide which has been used throughout

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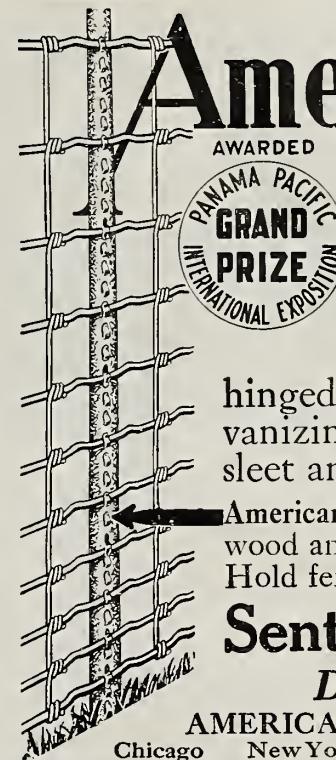
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the season, and we therefore recommend it to those who prefer sticking to one kind of material throughout. The first application for safety ought to be given just after the cluster buds unfold and before the leaves get to be much larger than squirrels' ears. This "semi-dormant" application gave an increase of from 30 to 60 per cent in clean fruit over plots sprayed first in the "pink" in one of our Hood River orchards this year. We used lime-sulphur, 1-20, and added a nicotine sulphate preparation to take care of the insects. Some burning was experienced and possibly a slight dwarfing of the first leaves, but the injury was insignificant in view of the benefit derived. The second application should be made in the "pink" stage, that is, just before the blossoms open. Here we used lime-sulphur, 1-35, with good results. Bordeaux caused russetting in our plots last season where used at this time, contrary to the usual expectations. The third spray is the "calyx" spray, applied when most of the petals have fallen. Lime-sulphur, 1-35, with arsenate of lead added for codling moth, should be used. The fourth spray should be given about "ten days" later. Under average conditions lime-sulphur, 1-35, seems to give the most satisfactory results. A fifth spray ought to be applied a month after blossoming and where the down has disappeared from the fruit, especially in the case of varieties not extremely subject to russetting, bordeaux may be used in the 3-3-50 or 4-4-50 strength. I am convinced that the omission of this application is not safe in most Oregon apple sections. Lime-sulphur, 1-35, may of course be used where burning is not feared.

The summer season is rarely favorable to scab, and where the orchard has been well taken care of in the spring there will be little trouble from serious new infections in the average fall. It would be safer, of course, to protect the fruit with an application of bordeaux or lime-sulphur sometime in August or early September. I have a feeling also that if the foliage were well covered in the fall from the start, few leaves would receive the infections which ordinarily result in the development of the winter stage. In other words, the primary spring infection might be materially reduced. The majority of previous experiments with fall spraying have, I suspect, begun too late to be effective. During the past season, bad as it has been, many growers from different sections of the state have secured a crop of 90 to 95 per cent clean fruit when their neighbors had only 5 to 25 per cent free from apple scab, with only spraying to account for the difference. Whenever there was failure in spraying it is attributable in practically all cases either to failure to have the trees protected at some critical time or to lack of thoroughness in doing the work. Apple scab can be controlled in this state or any other "when the right materials are used in the right way and at the right time."



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Cheer for Fruitgrowers

Continued from page 12

"The association had plenty of fine fruit in its own cold storage to supply demand through these new outlets created by real salesmanship. But as soon as healthy distribution began individual growers in the Northwest would ship in two or three cars that represented their whole crop and sell a little below association prices. In a little while box apples were on the toboggan slide, and the individual growers often got less than freight charges for their fruit.

"This price was scarce, pure and simple. There was no glut in those markets. Dealers had been shown how to make money out of box fruit, but the small individual shipments of a few cars, coming in at a slightly lower price, destroyed confidence. The fruit dealer who had his money invested in box apples did not know how cheaply his competitors would be getting similar fruit tomorrow. So he closed out his holdings and turned to barrel apples, or oranges, or something with greater stability.

"The unorganized grower brings price panic into the market in this way again and again, pulling prices down to a ruinous level, causing loss to all growers and dealers. He sets out with the idea, usually, that he can market his stuff himself to better advantage than anybody else can do it, and he winds up by selling it at a price five to ten cents below the market, because he lacks the real selling ability and the broad market information that would enable him to dispose of his fruit at a profit.

"In the produce trade there is also the small, fly-by-night buyer who picks up a few cars of stuff in growing districts, ships them to a good market and sells a nickel or dime below the true value in the same way.

"Together, these two pests cause enormous losses every year to growers who have organized for orderly marketing of crops, and to produce firms which would invest heavily in fruit and truck if they could count upon stability."—Hood River Glacier.

Apple Exports to Europe.—According to Mahlon Terhune, freight broker and forwarding agent of New York City, the following are the barrel-apple shipments of 1914 and 1915, for the weeks ending as follows: October 30, 1915, 105,610; October 30, 1914, 107,898; November 6, 1915, 51,207; November 6, 1914, 75,941; November 13, 1915, 87,451; November 13, 1914, 73,151; November 20, 1915, 85,359; November 20, 1914, 98,720; November 27, 1915, 75,030; November 27, 1914, 126,865; December 4, 1915, 102,588; December 4, 1914, 114,121. Apparently there is not such a great difference in the volume exported as most people imagine. However, space on steamers at the present time is very difficult to obtain for export and arrangements very uncertain, for the reason every now and then vessels are commandeered.

The Exhibit of the Schmidt Lithograph Company at the National Apple Show, held in Spokane, contained two features in connection with the box of apples packed under the "Skookum" brand that are well worthy of the fruitgrowers' attention. These two features being the beautiful price card and also the corrugated layer paper which was used for the purpose of preventing bruising by the lid and bottom of the box.

DOW ARSENATE OF LEAD

For the past eight years this material has successfully lead all others. Quality is our watchword, and you can use **Dow Arsenate of Lead** with the feeling that you have the best that money can purchase. When the codling moth is as numerous as it has been the past season, it affords a good opportunity to demonstrate the real value of **Dow Arsenate of Lead**, and the record it has made in the Northwest the past season should cause you to insist upon this brand for the coming season's work. Address us for names of distributors in the Northwest, and we will be glad to refer you to one in your community or close by.

The Dow Chemical Company, Midland, Michigan

The Commission Man as a Market Necessity

By E. S. Gill, Seattle, Washington

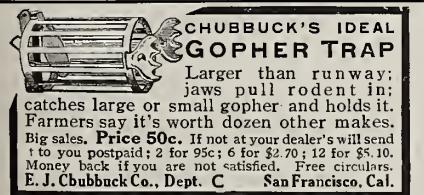
IT may well be said that the whole care of fruit from the beginning of the growth of the trees to the final marketing is a most complex problem. This convention, made up almost entirely of growers, knows that the growing of fruit in the Northwest is indeed a problem and it can only be made successful by those who become experts in the business. The same may be said of the marketing end. The day when anyone could become a fruitgrower, that is, a successful one, has long since passed away, and so it is with the selling.

The Yuba Bulletin
is published quarterly
for the benefit of pres-
ent and future Yuba
owners. It deals directly
with the tractor question.

**New Uses,
New Ideas,
New Methods.**

It will be sent free to those
requesting so of,

The Yuba Construction Co.
Dept. C-30,
433 California St.,
San Francisco, Cal.



Selling in these days requires trained and skilled men.

For a number of years there has been a great hue and cry about eliminating the middleman. He has been called a robber, a pirate, and about everything else that could be suggested as referring to a dishonest person. But when all is said and done the people of sober sense realize that these epithets have been bandied about by the unthinking, and that the middleman is very much of a right-minded human being just as are those in other walks of life. He has filled a place in the business of the world that modern conditions have created, and we could no more carry on business without him than we could pack apples without the boxes to pack them in. Inventions of the last forty years have changed the whole method of doing business, both wholesale and retail. The day when the grower could drive into town and meet the consumer has passed, never to return.

The consumer may talk occasionally about wanting to be able to buy from the producer, but it is only the expression of a dream thought, for when it comes to actual practice the consumer will not change from his present convenience of going to the telephone and calling his favorite grocer and giving an order. So the grocer has found that in order to always be able to fill the wants of his customers he must be able to secure goods when wanted, and in order to do this he must patronize the jobber, or what we designate in the fruit business, the commission man. The commission man, like the retailer, is a necessary outgrowth of modern business conditions. Retailers found that they could not depend upon the growers. Shipments were irregular and not always well prepared, and as a consequence men stepped in to superintend the shipment and receipt of goods at the large centers so as to always insure a supply as needed. These men handled goods sent into the big markets on a commission basis, acting as selling agents for the shippers and as warehousemen, storing goods when the market was over-supplied, or repacking when the goods

were not in the right condition for the market, endeavoring in this way to secure the largest possible returns for the consignee.

In recent years it has been quite the fashion in nearly all walks of life to abuse and denounce all those who were apparently successful financially. We have heard a great deal about "Big Business," so much so that in recent years every successful man has been classified as a member of "Big Business." In the hue and cry, the commission men have been the object of special attack, these attacks going so far in this state as to include legislation seeking to not only place safe-

The Spray That Sticks

ADHESO
REG. U. S. PAT. OFF.

Insecticide—Tonic—Fungicide

WHEN other spray materials fail to do their work, because rain washed them off, "ADHESO" STICKS, killing the Codling Moth and preventing the Scab, Apple Blotch and Bitter Rot, because IT STAYS WHERE IT IS NEEDED and does not wash off on the ground.

"ADHESO" GAVE 99% CLEAN FRUIT THIS YEAR, the worst in fifteen years for Codling Moth and Scab.

Write for details and means for making the STANDARD TEST FOR ADHESION.

"Triangle" Brand Arsenate of Lead

The reason why our Arsenate of Lead costs more than others, was shown this year. Ask the growers who used it. They DID NOT LOSE 50% to 75% by WORMY APPLES. It is not the COST PER POUND but RESULTS IN CLEAN FRUIT THAT COUNT.

Ansbacher Insecticide Co., Inc.
527 Fifth Ave., NEW YORK CITY

YOU CAN EARN \$50.00 PER DAY

with the Gearless Improved Standard Well Drilling Machine

Drills through any formation. Five years ahead of any other. Has record of drilling 130 feet and driving casing in 9 hours. Another record where 70 feet was drilled on 21-2 gallons distillate at 9¢ per gallon. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W-8.

REIERSON MACHINERY CO., Mfgs., 1295-97 Hood St., Portland, Ore.

All Refinery Gas—not a mixture

Dealers everywhere and at Service Stations of

Standard Oil Company (California)

Red Crown
the Gasoline of Quality

guards around the honest commission man and shipper, but attempting to say what the commission man should charge for his services.

This is radicalism run mad. The secretary of this honorable body is a Consulting Horticulturist, probably the first man in the United States to take up that line of work as a profession. He is an expert in his line and is entitled to such fees as people will pay for his services. Yet that is just what the legislature of 1911 attempted to do with the commission men. After prescribing that they should file bonds—something that everyone favored, as it would help to keep out the irresponsibles—the law prescribed in so many words that the commission man doing business in the State of Washington could only charge ten per cent for his services.

Ten years ago, and even up to two years ago, commission men were trying to do business in this state on the basis of ten per cent. Ten years ago they were making a reasonable profit at that figure, but about that time a period of freak legislation began when loud-mouthed agitators were going to remedy all the ills of mankind by law. The enactment of these laws have been a most potent factor in increasing the cost of doing business in this state. Taxes, for instance, have been more than doubled. Wages have increased with the increasing cost of living, rents have been on the upward trend and the general overhead expense of doing business has increased not fifty per cent but from seventy-five to one hundred per cent in the last ten years, until the commission men found they were not making expenses on a ten-per-cent basis and raised the fee to fifteen per cent.

There is not as much profit in fifteen per cent commission in this state today as there was in ten per cent ten years ago, and I want to say to you now, that unless the horticulturists join with other lines of business to put a stop to the freak legislation of recent years, the commission in this state will go up to twenty per cent, the present basis in our neighboring country of Canada. To deify all jobbers and commission men as robbers and thieves is as unjust and unthinking as to denounce all fruit-growers as tricksters and robbers, because forsooth some few try to work off a large percentage of their fancy and C grade fruit into the extra fancies. Taken as a whole the fruit jobbers, or commission men, if you please, are as honorable a set of men as you can find in any other line of business. Firms like some of the older ones in Seattle, that have been in business for 25 to 30 years, could not have gone on all these years if they had been owned and controlled by dishonest men. Old firms like some of those in New York, Chicago, Pittsburg and other cities, that have been in business from 30 to 50 years could not have continued all these years if they had not dealt honestly with their patrons.

"Land Clearing"

K HAND POWER STUMP PULLER

Send for this free book on land clearing. It tells how to get your stumps out cheaply and quickly—without teams, digging, or blasting—with the

HAND POWER

K Stump Puller

With its $2\frac{1}{4}$ to 1 leverage one man can pull any stump that can be pulled by any horse power machine. Owners report pulling from 50 to 100 stumps per day. Made of Krupp steel—weights only 171 lbs. Send for Book and Special Offer.

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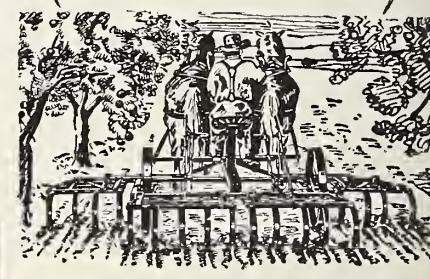
FORKNER Orchard Cultivator

Does more work with less draft and leaves a better dirt mulch than any other cultivator. It

WORKS RIGHT UP TO YOUR TREES

Stirs the entire surface beneath low branches without disturbing boughs or fruit. Write for catalogue and free book "Modern Soil Tillage."

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Proprietors

HOOD RIVER, OREGON DUFUR, OREGON

Growers of high grade nursery stock, guaranteed true-to-name. Breeders and importers of purebred Big Type Poland-China Hogs. Service boars, bred gilts and weaning pigs for sale.

For catalog of nursery stock and prices on swine, write

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Successful is the result of successful Orcharding

tillage. Cultivate your

trees as you would your corn—use an

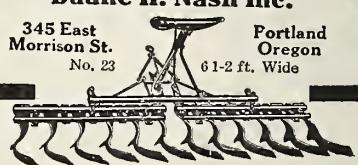
"Acme" Orchard Harrow

It gets in close under the branches. Cuts, slices, turns the soil twice, levels and compacts—all at one operation. Many sizes—extension and regular. Kills small weeds, cultivates deep, mulches thoroughly. Send for new free booklet—now.

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Portland
Oregon
61-2 ft. Wide



After two years' trial of "From the Producer to the Consumer" marketing plan, the Department of Agriculture recently issued Bulletins Nos. 266 and 267, in which it says: "The development of transportation facilities and the extension of our agricultural area have widened the distance between producer and consumer. This is as true commercially as it is physically. The extensive commerce in food products has called into existence many special agencies in that large class known as 'middlemen.' During recent years there has been a great deal of agitation against those engaged in food distribution. It is probably not going too far to say that, to the uninitiated, the middleman is a rather hazily defined person, whose chief function is to levy, arbitrarily, a heavy tribute on all food-stuffs passing from the producer to the consumer. The attention of the public has been directed to increased costs rather than to service rendered. Evidently it has never occurred to many who clamor for reform that economic conditions would not permit the long-continued existence of a marketing agency which was simply a parasite. Sooner or later business competition must eliminate all intermediate agencies which perform no definite useful function."

The bulletins further discuss the relations of producer to commission man, pointing out the difficult and trying position of the commission man in dealing with the producer at long distance, and in closing says: "In general, it may be said that a large part of the stigma which attaches to the business of the commission merchant arises directly from the difficult position which this middleman occupies in distributing machinery." I wish every one here would secure a copy of these two bulletins. I believe they will help to clear up some of the misunderstandings and suspicion of the past.

Let us get together and work out our mutual difficulties as hard-headed, practical men. I can assure you on behalf of the commission men of Seattle that we are ready at all times to co-operate with you in the enactment of legislation for our mutual good. Reputable commission men favor bonding those engaged in the business. They all use a uniform system of accounting by

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Wholesalers of Nursery Stock and Nursery Supplies
A very complete line of
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SPECIALTIES
Clean Coast Grown Seedlings
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Write Now Write Now

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READY FOR USE

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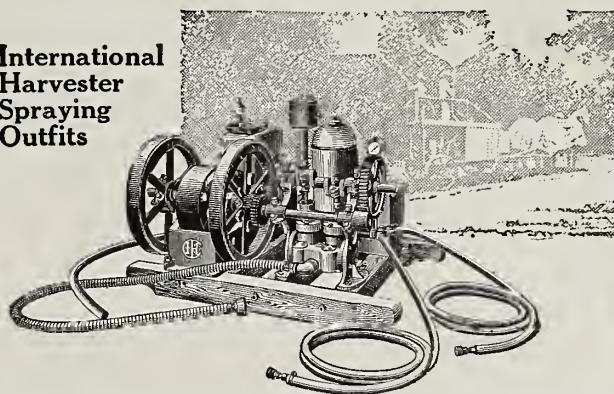
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Guard the Orchard

International
Harvester
Spraying
Outfits



GOOD spraying not only increases the marketable crop of fruit, but it protects the trees. Good spraying gets into every cranny, destroys the hiding disease and insects. Good spraying enables you to get the maximum fruit crop value each season. When you buy the high-grade **International Harvester** outfit required to do good spraying, you really get it for nothing — for the extra profit from your orchard soon returns your money.

International Harvester spraying outfits give the best and most thorough service. The **Titan** engines are simple, easily run, built with the care put into all **I H C** engines. The spray pumps are durable and powerful.

International Harvester spraying outfits are adapted to small and large orchards, vineyards and truck gardens, and are made in several types — on skids, on portable hand trucks or complete with tank, platform and wagon.

See the **I H C** dealer about an outfit. We have an interesting Spray Book containing reliable information on how and when to spray, and what to spray for. Write for it.

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(EXTRA FANCY)

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When ordering apples specify Blue Ribbon Brand and be assured of the best the market affords. All apples packed under our personal supervision and inspection.

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produce big crops of big, fancy berries from June until November. Light freezing does not affect their fruiting. The berries are in great demand. Price ranges from 30 to 45 cents per quart. Three months after plants are set, your profits begin. Our *free book* tells the rest.

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the best and most complete strawberry book ever written, *Kellogg Way*. 64 pages of fully explains the common sense, actual experience, strawberry facts, pictures galore. *Kellogg's free book*, *Kellogg's free service* and *Kellogg Pedigree Plants* insure your success. Our book is worth its weight in gold—costs you nothing. Send for copy today. A postal will do.

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RHUBARB

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WAGNER'S IMPROVED WINTER RHUBARB

If planted NOW you should derive good results. Also BERRIES and small fruit. Write for prices. J. B. WAGNER, Rhubarb, Berry and Cactus Specialist, Pasadena, Cal.

CONDON'S NEW LIGHTNING RADISH
Finest Early Radish in Existence. Ready to eat in 14 days. To introduce Our Northern Growers "Sure Crop" Live Seeds we will mail you Big Package "Condons New Lightning Radish" and our Mammoth Illustrated 1916 Garden and Farm Guide. Send name and address on postal card today.

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Here's a book of daily needs you should keep handy. It lists the best of every thing for the orchardist and truck grower. Standard spray materials, harsrows, cultivators, graders, pickers, packing boxes, etc. If there's anything needed, "ask Pratt." You know him—he's the man who makes "Scalecide—the tree saver." Everything else he sells is just as good.

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is under his direct supervision and he is always ready to advise, from his long experience, just what implement, spray material, etc., you need. Ask questions. But send for the book today.

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NORTHWESTERN AGENTS

PRATT'S "SCALECIDE"

BETTER FRUIT

which itemized account sales can be furnished on request, but they know and you know that you cannot fix by law a price at which a man must conduct his business, whether that price meets his expenses or not. I believe I can see this question from both sides of the line, for my interests in the growing of fruit are greater than those in the marketing end. But fairness and square dealing is necessary from both sides, and to this end I assure you the commission men of the state are ready and willing to work with you.

Getting Together in Marketing

Continued from last issue

Next to creating a disposition to get together, the important move just at present is to get the jobbers and dealers on the consuming end to help us increase our outlets. It is a waste of energy to think of building up a competitive organization to our present jobbers. Our best success depends on getting their co-operation, getting their hundreds of traveling fruit salesmen to help us get the communities they visit ready for our fruits, at the proper time, before the fruits are too ripe and markets glutted. In the past, the fruit salesman in the Middle West has been telling the retailers to wait for the glut, and they have waited. We want to get our joint-selling boards and reciprocal marketing arrangements so perfected that the trade will not wait but will order from the first. I believe an organized effort should be made through the Western Fruit Jobbers' Association, representing all the jobbers west of Chicago. Live distributors at the other end who are familiar with our problem can be of great assistance to us in preparing markets to take a much larger supply than they now take. I think a committee from the Northwest fruit shippers should be sent to the January meeting of the Western Fruit Jobbers' Association to be held in Memphis and secure their co-operation.

Another thing we need is more sympathetic co-operation of railroads—loading in transit and unloading in transit, less heater charges and diversion charges, and less freight rates, especially apples to Chicago. It has been suggested that 20,000 cars of apples are likely to be grown in the Northwest next year, and that we may fall down marketing them. It is not whether we have ten thousand or twenty cars to market, we only have from six to ten per cent of the apple crop of the United States in either event. The big factors are, first, whether we are organized properly to market any amount, and, second, fruit-crop conditions elsewhere and world conditions. If we cannot get our statesmen to provide a merchant marine; if we cannot get the railroads interested in our industry except to see what new taxes and hardships they can impose upon us, we are indeed in hard straits. But I believe if we go after it in earnest, if we get together and work together, we can get necessary con-

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GOOD SEEDS
GOOD AS CAN BE GROWN
Prices Below All Others

I will give a lot of new
sorts free with every order
I fill. Buy and test. Return
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Big Catalog FREE
Over 700 illustrations of vegetables
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and your neighbors' addresses.
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FREE Our handsome 1916 **Seed Catalogue**. Fully illustrated in colors. Reliable seeds at bargain prices. A full line of garden and flower seeds. **Cherry's Famous Dependable Seeds**, fresh and reliable, are used by successful gardeners everywhere. Send your name and address on a postal for a copy of our bargain catalogue.
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Protect Your Trees

DON'T take chances with your young trees. One rabbit will kill many in a single night. We find cut worms will damage and destroy them if you don't protect them. Get dollars' worth of protection at a fraction of a cent cost by using

Hawkeye Tree Protectors

Absolute protection against gnawers and borers. Prevent trees from becoming skinned and bruised by cultivator or lawn mower. Made of elm veneer, chemically treated. Easily put on and will last until tree is beyond protection. Do not let a single one of your trees be killed—order Hawkeye Protectors now. Regular size 10 inches wide, 20 inches high. Price in lots of 100—1 cent apiece, in lots of 1000—3/4 cent apiece. Special sizes made to order. Write for circular and samples.

We make **Fruit Baskets** — get our prices. **Burlington Basket Company**
122 Main St., Burlington, Iowa

Tells why chicks die

E. J. Reefer, the poultry expert, 3392 Reefer Bldg., Kansas City, Mo., is giving away free a valuable book entitled, "White Diarrhoea and How to Cure it." This book contains scientific facts on white diarrhoea and tells how to prepare a simple home solution that cures this terrible disease over night and actually raises 98 per cent of every hatch. All poultry raisers should certainly write Mr. Reefer for one of these valuable FREE books.

HAWKEYE SHIPPING BASKET
FOR CIRCULAR & PRICES WRITE TO:
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BURLINGTON, IOWA

Ask for Catalogue No. 5

cessions from the railroads, we can get co-operation from the wholesalers and jobbers, and unitedly we can get distribution of our fruits.

We have had black days for all kinds of business, we have had hard times for wheat and grain farmers. I remember raising oats for eleven cents a bushel and wool for ten cents, and corn and hogs at a loss. The men who stay with the fruit business will yet see good profits in fruit. Our business is not to be blue; look up, not down. Look forward, but we ought to get together in a practical way and do things like men with common sense, to retain all our fruit outlets and multiply new ones. We can and we will succeed if we get all our forces together—take the growers and shippers as they are, and unite all the marketing forces in a practical, feasible way.

Horticultural Notes

From time to time in the past "Better Fruit" has mentioned various exhibits made at the Panama-Pacific Exposition that would be of interest to the fruitgrowers, as information was received from various sources relative to these exhibits. It is with regret that these notes have not been more complete. In the way of explanation, it must be said that "Better Fruit" had asked one of the men connected with the fruit industry to write a page or two of notes on all exhibits made at the Exposition that would be of interest to the fruitgrowers. However, this failed to materialize on account of the pressure of other business. The Friend Manufacturing Company of Gasport, New York, manufacturers of power outfits, has a very interesting and attractive exhibit at the Panama-Pacific Exposition. They are to be commended for this for the reason they are located so far from San Francisco, making a heavy extra expense on account of the distance. The Friend exhibit consisted of their spray outfits, spray nozzles and other features connected with their outfit. The Friend Manufacturing Company do a very large business in New York State, and an extensive business throughout the United States. That their exhibit was worthy of merit is evidenced by the fact that they obtained the Medal of Honour, which is only given to exhibits of very high merit. In addition, the Friend nozzle received honorable mention.

Winter Rhubarb.—For the past few years "Better Fruit" has been advising several kinds of diversity for the fruitgrower, which are very much needed for the following reasons: In the years when the production is heavy prices are apt to be low, and in years when the prices are high sometimes the quantity is shy. In addition to this, fruitgrowers only get returns once a year, and therefore if they can add a few side lines, or even one good side line, which will bring in some money regularly will be found to be a big help financially. "Better Fruit" has recommended dairying, hogs, bees, truck gardening. Quite a number of fruitgrowers have made a splendid success and good profits by growing asparagus; others have engaged in a more general line of truck gardening. The Northwest is dependent upon California for its early-spring vegetables, which of course are very expensive on account of freight. There is a variety of vegetable grown in California, which is being introduced by Mr. Wagner, called Winter Rhubarb, which, we are advised, thrives in a very rigorous climate, grows quickly and produces very bountifully. It has generally been recommended that it should be planted some time during the months of October, November and December, but if planted early in January there would probably be sufficient time to produce a very early spring crop, which would bring in some extra income for the fruitgrower at a handy period.

"Sweet-Corn Culture." is the title of a new book edited by Mr. Wilkinson, which is an excellent treatise on growing sweet corn, published by the Orange Judd Company, 315 Fourth Avenue, New York.



Our Motto

HIGHEST QUALITY

OUR 1916 ANNUAL CATALOG

Written, compiled and printed especially for the Western
Planters of **Seeds, Plants, Bulbs, Roses, Trees, etc.**, and
users of **Sprays, Spray Pumps, Fertilizers, Incubators**
Brooders and Garden Supplies.

A Reliable, Honest, Truthful Guide Free on Request

New Policy: "Direct from Grower to Planter." **No Agents.**
Charges Prepaid. Ask for 1916 Catalog, No. 27.

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The Fortieth Anniversary Edition of Burpee's Annual, the Leading American Seed Catalog for 1916, is brighter and better than ever before. It offers the greatest novelty in Sweet Peas, the unique "Fiery Cross", and other novelties in Rare Flowers and Choice Vegetables, some of which cannot be had elsewhere. This book of 182 pages tells all about proved and tested Seeds. It is mailed free. A post card will do. Write today, mention this publication.

W. ATLEE BURPEE & CO., Burpee Buildings, Philadelphia

Pear Trees for Sale

I have a large lot to offer of the following sorts: **Bartlett, Anjou, Bosc, Winter Nelis, B. Clairgeau, Howell, Comice** and other varieties. All budded trees, one and two years old.

I also have **Plum and Prune Trees** budded on plum, and budded **berry-bearing and seedling Holly Trees** from 2 to 5 feet. Also **Mazzard Cherry and Marianna Plum** stocks for nursery planting.

Good stock at very low prices to Nurserymen, Dealers and Planters.

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Kelso, Washington



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THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. We pay Express charges on all orders. Write for circular and prices.



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There is a great difference in spray pumps and spraying apparatus. One kind is made by practical orchardists and has been improved through over 20 years of orchard success. Write a letter or postcard to **Morrill & Morley Mfg. Co.** Find out about **Eclipse Spray Pumps**

In use in more successful orchards than all other makes. Used by U.S. Department of Agriculture. Find out what Eclipse offers in more profits for orchards, vineyards or potato fields. Address **Morrill & Morley Mfg. Co., Box 12, Benton Harbor, Mich.** Send for Free Catalogue

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LET me send you an engine to earn its own cost while you pay for it. **Easy to start; no cranking;** easy to understand and manage; and easy to pay for on any suitable, reasonable terms of payment, during a year. I have helped many thousands to own engines in this way, during my 29 years of engine building.

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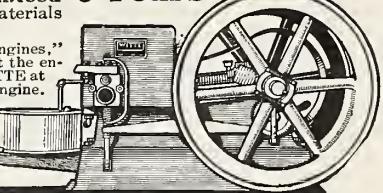
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SEE THESE LOW PRICES: 2 H.P., \$34.95; 3 H.P., \$52.45; 4 H.P., \$69.75; 6 H.P., \$97.75; 8 H.P., \$139.65; 12 H.P., \$197.00; 16 H.P., \$279.70; 22 H.P., \$359.80. (F. O. B. Factory) Portable Engines and Saw-Rig outfits proportionately low. **Guaranteed high quality**—as durable as superior design, best materials and workmanship can make.

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Portland Hotel

The hotel which made Portland, Oregon, famous
Most Desirably Located. In the Center of Shopping and Theatre District
Covers a City Block.

Broadway, Sixth, Morrison and Yamhill Streets
European Plan—\$1.00 per day and upward

Write for Portland Hotel Booklet.

GEO. C. OBER, Manager

The North Pacific Fruit Distributors, November 10th, issued a very interesting circular showing a Twenty-eight Months Record, some of the information being in reference to the volume of business. In twenty-eight months the North Pacific Fruit Distributors have distributed \$826,701.74; the total number of cars handled during this period was 12,276. The operating cost for the season of 1915 on the date mentioned was \$56.96 less than the budget prepared in advance. Quick returns are indicated by the statement that the average time elapsing between the dates of shipment and remittance of proceeds from the central office to the shipping associations has, for the present season to date, been twenty days. Carlot sales were made to 367 cities in 1914, compared with 243 cities in 1913. Exports through foreign ports in 1914 showed an increase of 324 per cent. Statements are also made that the North Pacific Fruit Distributors, supported by seven branch offices and one hundred exclusive sales agents, enabled the Distributors to make cash f.o.b. sales on 97½ per cent of its fruit. On 12,276 cars sold, the total loss through inability to collect is stated as being \$418.07.

Mr. J. B. Knapp, secretary of the Pacific Coast Veneer Association, has advised "Better Fruit" that the Pacific Coast Veneer Manufacturers are showing their interest in caring for the fruit industry by endeavoring to formulate some sort of plan whereby warehouses can be established in the different fruit sections which will carry a supply of containers for all kinds of small fruits. Such a move on their part will certainly be greatly appreciated by the fruitgrowers in the different districts. It is only by bringing containers for small fruit into different fruit districts in carload lots that they can be obtained at a minimum figure. Individual growers are not able to order in carload lots, so if some source of supply can be established in the different fruit districts it will be a big factor in enabling fruitgrowers to purchase the number of containers they require at minimum cost, and in addition to this it will be a big convenience, which will be highly appreciated by all fruitgrowers.

New Fruit Creations.—The Pitless Prune and the Plumcot are two comparatively recent creations by Luther Burbank. Both fruits have been sold in San Francisco by Levi Zentner Company. It is stated the Pitless Prune has a pit no larger than the size of a pea in a very small cavity. Commission men say, judging from its initial appearance, that it will be a serious competitor of the Standard French Prune. The Plumcot was created several years ago, a cut of this plum appearing on the cover page of the January, 1908, edition of "Better Fruit." It is a red fruit, nearly two inches in diameter, with a smooth skin like the plum, with the apricot flavor predominating. Fruitmen consider it a valuable addition to the fruit markets. Another creation by Luther Burbank is the Giant Cherry, which has been grown commercially to some extent in Vacaville Valley, California.

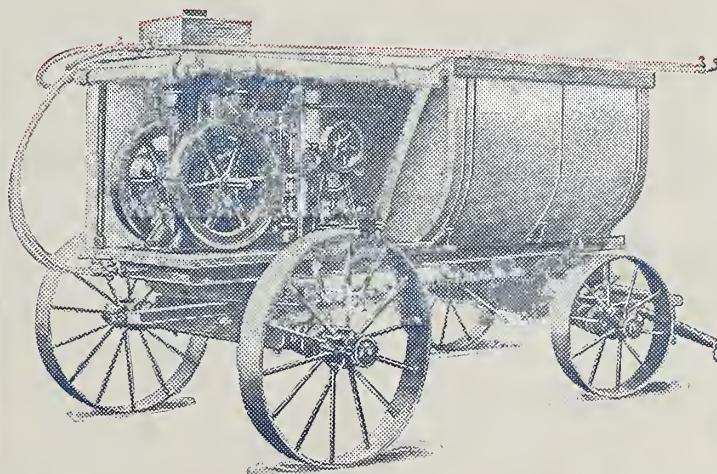
The Indiana Apple Show was held at Indianapolis, Indiana, November 6th to 13th, showing a marked improvement in quality and the number of exhibits over previous shows. Everyone who attended felt fully repaid, because the apple show was a splendid success in every feature. In addition to the show, there was a splendid program for the fruitgrowers, consisting of a number of good addresses by the ablest men connected with the fruit industry. The Purdue University exhibit was a notable feature of the show, the principal feature exhibit being a hollow apple sixteen feet in diameter covered with Ben Davis apples, it requiring 18,000 Ben Davis apples to cover this immense structure.

Apple Exports to South America.—According to Mahlon Terhune, freight broker and forwarding agent of New York City, the following are the box-apple shipments to South America in 1915: October 30, 22,960 boxes; November 13, 27,191 boxes; November 27, 17,158 boxes. In addition to this, quite a large quantity of pears, grapes and other fruits were also exported to South America.

Grandview, Washington, has completed arrangements for the erection of a cannery. The building will be commenced about February 1st. The cannery is intended to put up apples, peaches, pears and other fruits, and later on will take on the canning of vegetables.

THE HARDIE Manufacturing Co.

Our many models enable the orchardist to equip his orchard with the machine meeting his individual requirements in size, construction and price.



The Western Triplex is the all-around sprayer. The detachable truck can be used for general farm purposes as well as on the sprayer. Its ample power and capacity meets the requirements of the largest growers.

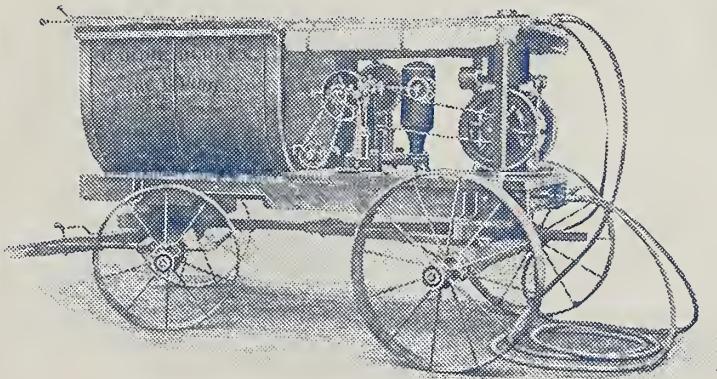
THE WESTERN TRIPLEX

All Hardie Sprayers are made up by specialists who have devoted years to this one line.

To any grower who seeks not only spraying results but economy of operation and upkeep as well, our machines will prove of the greatest interest.

Our line is broad enough to fill every spraying need and specialized enough to fit every individual orchard requirement.

Smaller than our Triplex, it is strongly built and carries the same high quality of design and materials.



All Hardie Pumps have our Peerless Pressure Regulator. All Engines have built-in, gear-driven magnetos. All are built for hardest continuous service.

THE HARDIE DUPLEX

On proper spraying much of your profits depend. Now is the time to plan for a better crop for 1916 by writing today for our new catalog which tells the complete story of the

Hardie Power Sprayers, Hand Pumps and Accessories

The Hardie Manufacturing Co.

49 N. Front Street

PORTLAND, OREGON

THE WORLD

OUR ORCHARD

STEINHARDT & KELLY

One Million Dollars in Box Apples

It is something to be proud of to have the first call from almost all of the best growers of the West and Northwest, who know what we require and that we can use the largest quantities of the very finest fruit they raise.

They come to us year after year to give us preference in prices for these good reasons:

FIRST—We can dispose of larger quantities of their fruit than any other house in the country.

SECOND—We have been their best patron for many years and have always met our obligations punctually.

THIRD—We have more actual consumers of fruit, who keep on coming to us year after year because we take the best care to satisfy their wants and requirements.

FOURTH—Taking our entire holdings we handle more high-class stock than any house in the country.

FIFTH—We personally select our fruit in the growing centers, not so much with the sureness of profit as for the certainties of excellence and the belief that we know what our trade deserves.

SIXTH—The growers from whom we purchase get ideas from us as to what the very finest trade want and they know that we have helped raise the standard of excellence of the fruit industry.

But as to being proud—we are most proud, not only of our customers, but also of the growers, without whose help our efforts would be practically in vain.

We believe we have succeeded in assembling under our direction the very best packs of box apples from the premier districts of the Northwest.

We desire to herewith mention the names of a few concerns whose output we handle on this market:

NORTH PACIFIC FRUIT DISTRIBUTORS and Allied Associations

NORTHWESTERN FRUIT EXCHANGE and Allied Connections

CASHMERE FRUIT GROWERS' UNION

PESHASTIN FRUIT GROWERS' ASSOCIATION

WENATCHEE GROWERS' EXCHANGE

HOOD RIVER FRUIT GROWERS' EXCHANGE

SEBASTAPOL APPLE GROWERS' UNION

MOSIER FRUIT GROWERS' ASSOCIATION

WENATCHEE VALLEY FRUIT GROWERS' ASSOCIATION

YAKIMA FRUIT GROWERS' EXCHANGE

YAKIMA COUNTY HORTICULTURAL UNION

RICHEY & GILBERT, North Yakima

E. E. SAMSON CO., North Yakima

SPOKANE FRUIT GROWERS' CO.

Etc., Etc.

Steinhardt & Kelly

NEW YORK

OUR MARKET

THE WORLD